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THE PROFESSIONAL CERTIFICATION OF PHARMACISTS.

DR. WALTER A. BASTEDO, Professor of Pharmacology at the College of Physicians and Surgeons, at the joint meeting in 1910 of the New York Branch of the A. Ph. A. and the Medical Society of the county of New York, proposed that pharmacists should be professionally as well as legally certified, just as the better grades of milk are distinguished from those which barely meet legal requirements by being especially "certified."

Otto Raubenheimer took up and expanded this idea in his address as Chairman of the Section on Practical Pharmacy and Dispensing, at the Richmond meeting in 1910, and upon this address the committee to which it was referred reported as follows:

"The unique suggestion of Dr. Bastedo regarding the certification of pharmacists, to which our chairman has called attention, should not be allowed to pass without action, and suggestion is made that a special committee be established by the Section on Practical Pharmacy and Dispensing to consider the subject and report on the same at the next annual meeting."

Unfortunately, this important question was permitted to remain dormant until the joint meeting of the New York Branch of the A. Ph. A. and the Medical Society of the county of New York on May 7, of the present year, when it was revived by Mr. Raubenheimer in his discussion of the papers presented. He made the point that the prescribing physician knows the reliable pharmacists and pharmacies in his own neighborhood, but is entirely at sea when called from

home, and that there should be some method of certifying the pharmacies at which physicians can have absolute confidence that their prescriptions will be compounded correctly, and with the skill and care of the properly trained pharmacist whose business is conducted in accordance with medical and pharmaceutical ethics.

Following Mr. Raubenheimer's remarks, Dr. Jacob Diner made an eloquent appeal for the adoption of the suggestion made by Dr. Bastedo, and offered a motion, which was promptly and unanimously adopted, that there be a joint committee consisting of ten physicians from the Medical Society of the County of New York, and ten pharmacists from the New York Branch of the American Pharmaceutical Association to consider the matter and, if found advisable, to report to their respective societies the requirements for the proper certification of pharmacists and pharmacies.

That modern pharmacy is somewhat professional and very largely commercial is clearly recognized, and the method of harmonizing and regulating these two factors has been a hackneyed subject with pharmaceutical essayists and editorial writers for a number of years.

Some who have not reckoned with existing conditions, have been inclined to view with contempt all of that portion of the everyday drug business that does not deal strictly with the compounding and dispensing of medicines and prescriptions and the furnishing of sick-room requisites, and have proposed that pharmacists should proceed to abandon all other portions of their business. In like manner some extremists on the other side have inclined to the view that the pharmacist should altogether divest himself of the so-called professional features of his calling, assume the position of a dealer in general merchandise, medical and otherwise, and make use of modern commercial methods of business exploitation.

Still a third class have considered both existing conditions and professional ideals. They have recognized that there are great possibilities in professional pharmacy for a certain rather small proportion of those who have been legally registered to conduct drug stores, but that for the larger proportion there is not sufficient opportunity for sufficient purely professional or technical work to afford a livelihood for the would-be professors thereof.

These have been inclined to propose that pharmacists who have the inclination and are properly situated should specialize along professional lines, and that the remainder should specialize in commercial directions.

That this latter proposition is not wholly without justification appears from the tendency during the past few years to recognize a distinction between strictly prescription pharmacists and general drug stores; and it may be that this proposition by Dr. Bastedo and the New York Branch will prove to be the thin edge of the entering wedge that shall make the cleavage between professional and commercial pharmacy clear and distinct.

In the opinion of the writer, no more important proposition has been brought up for some years, and it is suggested that members of the A. Ph. A. give it their careful consideration and freely express their opinions through the JOURNAL.

J. H. BEAL.

Contributed and Selected

DIRECT TITRATION OF ACIDS IN ALKALOIDAL SALTS.

A. B. LYONS, M. D.

It is a familiar fact that certain indicators for alkalies (e. g. phenolphthalein) are not affected by most alkaloids, so that the combined acids of alkaloidal salts behave in titration almost as if they were free acids. It is also well known that attempts to determine such combined acids by titration with volumetric alkali solutions fail because in a certain concentration the alkaloids after all show an alkaline reaction so that the end point of the titration is not sharp enough for an exact quantitative determination.

I have recently hit upon a little expedient by which it is possible to make such a titration with a pretty close approximation to exactness in the case of many alkaloids. The indicator which has given me the most promising results is methyl red, changed by alkalies to yellow.

If 0.301 gm. of crystallized morphine be dissolved in 12 cc. of decinormal hydrochloric acid and methyl red indicator be added, it will require just 10 cc. of N/50 alkali to change the color of the solution to yellow. If now there be added to the solution 10 cc. of neutral chloroform, and the mixture be shaken, the indicator will be taken up by the chloroform, leaving the aqueous solution colorless. If now volumetric alkali be added to the mixture, little by little, shaking well after each addition, no apparent change will be produced until enough of the alkali has been added to more than saturate the whole of the combined acid present. As soon as there is excess the aqueous solution will appear yellow instead of colorless after shaking. The quantity of volumetric alkali required to produce this effect (in this case 50 cc. N/50) is a measure of the amount of combined acid, and so of the amount of alkaloid present.

The effect of the chloroform must be to withdraw the alkaloid from the aqueous solution as fast as it is set free by the alkali.

This gives us a new principle to act upon in titrations of alkaloidal salts, and one which promises to work out satisfactorily in the case of many alkaloids.

When chloroform is used for the solvent and methyl red for the indicator, the end reaction is reasonably sharp with morphine, quinine and strychnine. It is possible that some other solvent might be better, and that another indicator may be still better suited for the titration.

There is a field here for experimentation that may develop useful results. Of course, the behavior of each alkaloid must be studied, since these vary greatly in their degree of alkalinity. I have not tried atrophine sales, and should not expect to find that their behavior is like that of the salts of morphine.

The plan will enable us to titrate a solution containing a mixture of alkaloidal

and alkaline salts, (e. g. chlorides) without previously reporting the alkaloid, giving at least an approximate determination of the vegetable base. If free acid is present, this may also be determined in the same operation.

A PLAN FOR DETERMINING BY TITRATION BOTH ACID AND BASE IN BENZOATES OR SALICYLATES OF THE ALKALIES.

A. B. LYONS, M. D.

Dissolve 0.25 gm. of the salt (e. g. Sodium Benzoate) in 10 cc. of distilled water in a separator. Add 25 cc. of decinormal sulphuric acid. Shake out the benzoic acid with four successive portions of chloroform, which must be proved to be free from alkalnity or acidity. The chloroform must be drawn off each time into a second separator in which it is to be shaken with 20 cc. of distilled water, to wash out any sulphuric acid which may have accompanied the chloroform. After washing thus, transfer the chloroform to a suitable flask, in which the free acid is to be titrated with N/25 volumetric alkali (lime water answers well), using as indicator methyl red. The end point of the titration is indicated by the appearance of a yellow color in the aqueous stratum after shaking with the chloroform.

The water in separator No. 2 is to be transferred to separator No. 1 and the residual acid is to be determined by titration with N/25 volumetric alkali. This excess deducted from the volumetric sulphuric acid originally taken, gives a measure of the benzoic acid which has been extracted, and consequently of the base with which that acid was combined.

Evidently this second titration is all that is usually required, but the first serves as a check on the result obtained.

The method should be tried in comparison with that of the U. S. P. VIII to test the question which of the two is the more exact on the one hand, and the more rapidly executed in practice on the other.

NOTES ON CHEMICAL TESTS OF THE UNITED STATES PHARMACOPŒIA.*

CARL E. SMITH.

(Continued from page 301.)

ACONITINA.—Requires 26 to 28 parts of alcohol for solution ("22 parts." U. S. P.). The melting point is not a good criterion of purity, as the alkaloid decomposes and melts at temperatures varying with the rate of heating. About 0.2 gm. should leave no weighable residue on incineration. Not all solutions of aconitine are laevogyrate, as B. L. Murray has pointed out; alcohol-solutions are dextrogyrate, water-solutions inactive, and benzene-solutions laevogyrate. Market products are variable in composition, frequently not responding to the perman-

*Analytical Laboratory of Powers-Weightman-Rosengarten Company.

ganate precipitation test, because of the presence of amorphous alkaloids, which may also be detected by a bitter taste of the weak solutions.

AETHER.—Determination of the specific gravity with results varying not more than two units in the fourth decimal place, has been described by G. D. Rosengarten *(Jour. Ind. & Eng. Chem.,* 1911, v. 3, p. 872) as follows: "A calibrated pyknometer of 25 cc. capacity is employed. To determine its volume the pyknometer is first weighed with water at 25° C., choosing a convenient mark on the stem, say 30 or 40, which may be the more convenient. The pyknometer is then filled with ether to a little above the mark at which the weight of water has been determined and placed in a 1000 cc. beaker containing water, which is carefully kept at 25° C. and constantly stirred with a thermometer. When the volume of ether becomes constant in the pyknometer the excess of ether is drawn off by means of a capillary pipette until the desired mark is exactly reached. The pyknometer is then quickly dried with soft flannel or filter paper and weighed. A capillary pipette for this purpose is easily made by drawing out an ordinary eye-dropper." Attempts to cause ether to boil in a test-tube by means of the warmth of the hand are seldom successful. This test should therefore be omitted and the boiling point determined in the regular manner. 25 cc. should leave no weighable residue on evaporation from a platinum or porcelain dish and drying the dish at 100°. The test for aldehyde should be made with exclusion of light. As peroxides are liable to form in ether on keeping, especially when exposed to light in partially filled containers, tests for these are important. Baskerville and Hamor recommend cadmium potassium iodide. The test may be made by shaking 10 cc. of ether with 1 cc. of a freshly made water-solution of cadmium potassium iodide (1 in 10), in a glass-stoppered tube, protected from light, occasionally during one hour. No color should develop in either liquid. Peroxides cause liberation of iodine. When cadmium potassium iodide is not available, a freshly made solution of potassium iodide U. S. P. (1 in 10) may be used with almost equally reliable results. For a full study of the tests of ether for anæsthesia, by Baskerville and Hamor, see *Jour Ind. & Eng. Chem.,* 1911, v. 3, p. 302.

AETHER ACETICUS.—It should not leave more than 0.01 per cent. of residue on evaporation. A more exact means than that given in the U. S. P. for determining the ethyl acetate contents is the following: About 4 cc. of acetic ether are weighed in a 100 cc. flask provided with a stopper of glass or rubber. A few cc. of water are added and free acetic acid neutralized with alkali hydroxide, with phenolphthalein as indicator. The neutralized liquid is then shaken briskly for a few minutes with 50 cc. of normal alkali, until the ester is dissolved. By shaking the mixture occasionally during 2 hours, the saponification will be completed without heating or it may be hastened by warming gently. If the reaction is incomplete, the unchanged ester may be detected by its odor, after cooling. The excess of alkali is titrated with normal acid. Each cc. of normal alkali (O = 16) corresponds to 0.08806 gm. of ethyl acetate. The sulphuric acid test for carbonizable impurities is rather too exacting, particularly when the ester is kept in cork-stoppered containers. A slight color at the zone of contact should be allowed.

AETHYLIS CARBAMAS.—It should not leave more than 0.05 per cent. of residue on incineration. In addition to conforming to the U. S. P. requirements, it should

stand the following tests: The water-solution (1 in 20) should be neutral to litmus, should not show more than slight traces of chloride with silver nitrate, and should show no nitrate by the ferrous sulphate test.

AETHYLIS CHLORIDUM.—The test for hydrochloric acid may be made more definite and practical by dissolving 1 cc. of ethyl chloride in 20 cc. of alcohol and adding a few drops of silver nitrate. No turbidity should be produced at once. This also serves as a test for ethyl bromide and iodide. The test of the last paragraph may be modified to advantage in this manner: On spontaneous evaporation of 10 cc. from a shallow dish no foreign odor should be noticeable while the last portions evaporate and no weighable residue should remain.

ALCOHOL.—Comments in pharmaceutical literature on the U. S. P. requirements indicate that these are fairly satisfactory. The chief criticisms have been that alcohol stored in wood-containers is excluded by the test for tannin and that the test for methyl alcohol is incapable of detecting smaller quantities than 2 per cent. As a result of experiments with various methods, J. Rosin proposes a modification of the present test, capable of detecting about 1 per cent. of methyl alcohol: 1 cc. of alcohol (95 per cent. by vol.) or a proportionately larger quantity of weaker alcohol is diluted to 10 cc. with water, in a 40 cc. test-tube. 0.5 cc. of sulphuric acid is added, the mixture cooled, and 5 cc. of a cold 15 per cent. water-solution of potassium permanganate added. After 2 minutes the precipitate produced is dissolved by addition of just enough sulphurous acid, and the liquid boiled until free from the odor of acetaldehyde. It is then cooled and 1 drop of a water-solution of resorcinol (1 in 200) added. A portion of this mixture is stratified over on equal volume of sulphuric acid. Not more than a light pink and no rose-red zone or whitish flakes near the zone should be produced. Legal's test for acetone is useful when adulteration with ordinary wood spirit containing acetone is suspected. It is conveniently applied as follows: To a mixture of 5 cc. of alcohol and 2 cc. of sodium hydroxide solution (5 p. c.) about 5 drops of a freshly made water-solution of sodium nitroprusside (1 in 50) are added, then acetic acid to a *slightly* acid reaction. No violet color should appear within 1 minute. For determining non-volatile matter platinum or porcelain dishes should be used instead of a glass vessel, as the U. S. P. directs, since glass loses appreciably in weight during contact with steam or hot water.

ALOIN.—According to J. M. Francis the product of the American market is *not* "chiefly prepared from Curaçao aloes," as stated by the U. S. P. He proposes that the vague requirements as to solubility and ash be replaced by the following: "Not more than 1.5 per cent. should be insoluble in either water, alcohol, or acetone. It should not leave more than 0.5 per cent. of residue on incineration." Of the identity tests given in last paragraph of the U. S. P., p. 36, only the first and the last are applicable to all permissible varieties of aloin. Solutions of aloin should be neutral or not more than faintly acid to litmus.

ALUMEN.—For identification as a potassium salt the test with sodium bitartrate is not conclusive, as ammonium alum also gives a precipitate with this reagent. The flame test is more reliable. Arsenic is a probable impurity not provided for in the U. S. P. tests. The official Gutzeit and Bettendorf tests can be used. The U. S. P. tests are not sufficient to determine if the salt conforms to the "rubric"

requirement of at least 99.5 per cent., as it may contain other impurities, such as ammonium, calcium, magnesium, chloride, and others. Quantitative determinations of aluminum and of potassium may be required in doubtful cases.

ALUMEN EXSICCATUM.—A literal interpretation of the requirements admits any dried alum, regardless of the amount of water it may have absorbed, provided it has a dry appearance and contains not more than 1 per cent. of impurities when in the anhydrous state. However, it was obviously not the intention of the Revision Committee to permit the presence of an indefinite amount of absorbed water, as the efficacy of the salt, for the purposes intended, decreases in proportion to th quantity of water it contains. As the salt is decidedly hygroscopic, a test defining a limit of water should be given. Foreign pharmacopœias allow 10 per cent.

ALUMINI SULPHAS.—This salt crystallizes with varying quantities of water under different conditions, the salt of the market sometimes containing more, sometimes less than 16 molecules. The German Pharmacopœia recognizes a salt containing 18 molecules. A salt containing only traces of free acid, as required by the U. S. P., cannot be expected to make a clear solution in water, because of hydrolytic dissociation. Excessive contamination with arsenic, for which no test is given, has sometimes been noted. The German Pharmacopœia directs the Bettendorf test. Determinations of aluminum and of water are required to ascertain if more than 0.5 per cent. of impurities are present.

AMMONII BENZOAS.—As Seidell and Menge have reported, neither the melting point nor the reaction to litmus paper is a satisfactory means of establishing purity. They recommend titration of the ammonia after distilling the salt with fixed alkali. For pharmacopœial purposes it is probably sufficient to titrate the free benzoic acid in a water-solution of the salt, with litmus as indicator. Pure ammonium benzoate is a little alkaline to litmus. Traces of chloride and sulphate should be allowed in this salt.

AMMONII BROMIDUM.—It does not volatilize "completely," but should not leave more than 0.05 per cent. o fresidue, when heated. A test for bromate is unnecessary, as it cannot exist in the salt when it has a slightly acid reaction. The standard of purity is now unnecessarily low, as the salt is readily obtained 99 per cent. pure, the chief impurity being ammonium chloride.

AMMONII CARBONAS.—Market products contain from 27 to 31 per cent. of ammonia; the U. S. P. standard of at least 31.58 per cent. is seldom reached. It should not contain more than 0.05 per cent. of non-volatile matter. The titration is made more conveniently with methyl orange as indicator without boiling.

AMMONII CHLORIDUM.—While nominally allowing 0.5 per cent. of impurities, the U. S. P. gives tests which exclude any salt less than 99.9 per cent. pure. As ammonium sulphate is the chief impurity in this salt, the requirement of almost entire absence of it is equivalent to requiring practically a chemically pure product.

AMMONII SALICYLAS.—The U. S. P. requires that a concentrated aqueous solution "should redden blue litmus paper." With much care a salt can be made having a slightly alkaline reaction, but unless perfectly dry and kept in full, tightly stoppered containers, it soon loses enough ammonia to acquire an acid reaction. Therefore, this requirement excludes a salt of the highest attainable purity, and

places a premium on a product containing considerable quantities of free acid. Free salicylic acid, which is practically the only impurity this salt is likely to contain in excess of traces, is best determined as stated under *Ammonii Benzoas*. Non-volatile matter should not exceed 0.1 per cent.

AMYLIS NITRIS.—It should be required to distil completely at a temperature not exceeding 110°, to exclude objectionable impurities, such as amyl nitrate and nitropentane. In the assay it is advisable to use only half the volume of potassium iodide solution and of sulphuric acid directed, but both should be of double strength. This hastens the reaction and makes it more nearly complete.

ANTIMONII ET POTASSII TARTRAS.—The limit of arsenic, which was changed in 1907, is by some critics considered too lenient. This impurity is found to be difficult to remove, and involves methods of purification that cause partial oxidation of the antimony, which would require lowering the percentage of pure salt in the product from 99.5 per cent. to 98.5 or 98 per cent. The tests for sulphate, heavy metals, and potassium bitartrate hardly show "absence" of these impurities as stated, but are sufficiently sensitive for practical purposes.

ANTIPYRINA.—The melting point as given by various authorities, including the more important recent pharmacopœias, varies from 109° (Danish Pharmacopœia) to 114° (French Pharmacopœia). Market samples examined during two years past, while otherwise conforming to all U. S. P. requirements, had melting points ranging between 105° and 113°, the entire melting intervals being included in these figures. The difficulty of obtaining products having uniform melting points has also been noted by Lefelt and others. Ash should not exceed 0.1 per cent. The U. S. P. test for acetanilide cannot be used, as pure antipyrine also responds to the iso-nitrile reaction, but complete solubility in 1 part of cold water excludes this adulterant, as well as phenacetine, sufficiently well.

APOMORPHINAE HYDROCHLORIDUM.—The salt of commerce, as furnished for medicinal purposes, is not anhydrous as the U. S. P. formula indicates, but contains ½ molecule (2.89 per cent.) of crystal-water, which it loses over sulphuric acid and regains on exposure to the air. About 0.2 gm. should leave no weighable residue on incineration. A test for decomposition products given by recent pharmacopœias consists in shaking about 0.1 gm. with 10 cc. of ether, when the latter should not become more than slightly reddish. Fresh stock, under these conditions, gives no color whatever. Frerich's test for other alkaloids including by-products of the manufacture of apomorphine, consists in placing about 0.1 gm. of the salt on a dry filter and washing it with a cold mixture of 1 cc. of hydrochloric acid, U. S. P., and 4 cc. of water. The washings may become turbid, but should yield no precipitate at once on the addition of Mayer's reagent. The test is based on the sparing solubility of apomorphine hydrochloride in diluted hydrochloric acid.

AQUA AMMONIA.—Non-volatile matter is more accurately and conveniently determined by evaporating a measured quantity without previous neutralization. Because of the solvent action of ammonia solutions on glass, 0.02 per cent. should be allowed in 10 per cent. and 0.05 per cent. in 28 per cent. solutions, although when freshly bottled they contain much less than this. Appreciable amounts of ammonia will be volatilized and results found too low, when the U. S. P. direc-

tions for the assay are followed. It is more practical to weigh the sample in a flask containing either volumetric acid or sufficient water to prevent volatilization.

AQUA HYDROGENII DIOXIDI.—Determination of acidity by direct titration, which is directed by most foreign pharmacopœias and sometimes recommended by writers in American journals is not reliable, as part of the alkali forms a combination with hydrogen peroxide which gives no color with phenolphthalein, according to Endemann and others. The U. S. P. method is to be preferred. The test for hydrofluoric acid is not delicate enough to prove "absence," but is sufficiently so to exclude objectionable quantities.

ARGENTI NITRAS.—In the test for lead the mixture with sulphuric acid must be kept hot to prevent crystallization of silver sulphate, which may be mistaken for lead sulphate. The test for foreign salts may give misleading results, unless several precautions are taken, which are not mentioned in the U. S. P. Hydrochloric acid should be added only in slight excess, to a hot solution of the salt, and the mixture allowed to stand until the liquid is clear. A little silver chloride still remains in solution, as a rule, and may be removed by evaporating the filtrate to dryness on a water-bath and taking up the residue with water and a few drops of diluted hydrochloric acid. Any insoluble matter should be filtered out and the filtrate evaporated. This test is superfluous, as the same impurities will be shown by the titration, when this is made with sufficient care to obtain results within 0.1 per cent.

ARSENI TRIOXIDUM.—It should not contain more than 0.1 per cent. of nonvolatile matter. Commercial products often contain over 1 per cent. To dissolve arsenic trioxide in sodium bicarbonate solution for titration, there is no objection to boiling in order to hasten solutions. The statement sometimes made that normal sodium carbonate, which is formed by heating, decolorizes iodine under the conditions of the assay, has been found erroneous. It is more convenient, however, to dissolve the sample in caustic alkali, neutralize, and add sodium bicarbonate, as proposed by Caspari, but presence of caustic alkali favors atmospheric oxidation and the solution should be neutralized without delay. Not less than 0.2 gm. should be taken for an assay, for accurate results.

ATROPINA.—The melting point of a considerable number of commercial samples were found to vary between 113° and 116°, the upper figure, together with other tests, indicating total absence of hyoscyamine in a number of cases. About 0.5 gm. should leave no weighable residue on incineration. About 0.1 gm. should dissolve in about 2 cc. of sulphuric acid without imparting to it more than slight yellow color and this color should not be more than slightly increased on addition of about 0.1 cc. of nitric acid. Entirely colorless solutions, as demanded by the U. S. P., are not obtained with any product of the market. A test for apoatropine and belladonnine, required by the more recently published pharmacopœias, consists in adding 2 cc. of ammonia water to 5 cc. of a water-solution of atropine (1 in 60) made with a slight excess of diluted sulphuric acid. No turbidity should be produced at once.

ATROPINAE SULPHAS.—The salt furnished to the trade contains about 1 molecule (2.59 per cent) of crystal-water and is somewhat efflorescent (the U. S. P. formula is that of the anhydrous salt, stated to be permanent in air). The

melting point varies greatly with the rate of heating.. According to Riedel the pure salt can be melted at 180° by slow heating and at 190° by rapid heating. Other pharmacopœias give melting points ranging from 180° to 184°. In other respects the remarks under ATROPINA apply also to this salt. The presence of hyoscyamine in atropine and its salts is best determined with a polariscope.

AURI ET SODII CHLORIDUM.—To be certain of complete precipitation of gold, in the assay, it is advisable to add a second portion of a few cc. of hydrogen peroxide solution about half an hour after adding the first portion. The same volume of liquid should be maintained during the period of heating, by addition of water if necessary. The precipitation is best made in a small, well-glazed, covered porcelain casserole.

BENZALDEHYDUM.—It is colorless only when freshly distilled and becomes yellowish on keeping a short time. A test for nitrobenzol is given in the Belgian and German pharmacopœias. It has been found satisfactory when made as follows: About 1 gm. of benzaldehyde is dissolved in 20 cc. of alcohol and enough water added to produce a slight turbidity. A brisk evolution of hydrogen is maintained in the solution for 1 hour by additions of zinc and diluted sulphuric acid. It is then filtered and evaporated to about 20 cc. On boiling this with 2 drops of potassium dichromate test solution no violet color (indicating presence of aniline) should be produced. The U. S. P. assay method, according to various analysts, does not give even approximate results. A sample, recently examined by H. C. Frey and the writer, in which no impurities other than about 5 per cent. of benzoic acid could be detected, assayed 51 per cent. by this method. No satisfactory method is at present known. An adaptation of the U. S. P. (Blank and Finkenbeiner) method for formaldehyde gave with the same sample 94.5 per cent., but several days were required for complete reaction. The U. S. P. tests, including specific gravity and boiling point, a test for nitrobenzol, and determination of benzoic acid (by titration in alcohol-solution, with phenolphthalein as indicator) should be sufficient to limit impurities, exclude adulterants, and define approximately the percentage of actual benzaldehyde.

BENZOSULPHINIDUM.—Described as "nearly odorless." It is odorless when pure, but usually has a faint aromatic odor. The melting point is given as 224° for the pure substance by some authorities, also for the medicinal substance by several pharmacopœias. Para-sulphamine-benzoic acid, often present as an impurity, melts at 280° to 283° and may raise the melting point of saccharin considerably. Market samples have been found to melt between 215° and 225°. Residue on incineration should not exceed 0.5 per cent. A series of 13 samples yielded from 0.13 to 0.33 per cent., chiefly sodium sulphate. A water solution should have a distinctly sweet taste in a dilution of 1 in 10,000.

BETANAPHTHOL.—The melting point of acceptable market samples varies from 119° to 123°. Other pharmacopœias give from 120° to 123°. Non-volatile matter should not exceed 0.05 per cent. The tests for alphanaphthol should be made in cold, saturated solutions.

BISMUTHI CITRAS.—A pure salt theoretically contains bismuth corresponding to 58.44 per cent. of bismuth oxide, which would be excluded by the present limit of 56 to 58 per cent. As stated in the Brit. Pharm. Codex, the salt usually

contains 2 to 3 per cent. of absorbed water, allowance for which should be made in an assay.

BISMUTHI SUBCARBONAS.—In the test for alkalies and alkali earths a limit of 0.2 per cent. should be allowed.

BROMOFORMUM.—A product containing only 1 per cent. of alcohol decomposes rapidly. The German and Belgian pharmacopœias require 4 per cent., with a view to better keeping qualities. Bromoform of the latter composition congeals at 5° to 6°, boils at 144° to 150°, and has a specific gravity of 2.829 to 2,833 at 15°/15°, according to the German Pharmacopœia. It should be free from suffocating odor (carbon oxybromide).

BROMUM.—The U. S. P. tests are not sufficient to determine if the limit of 3 per cent. of impurities is exceeded, no provision being made for the limitation of chlorine, which is the principal impurity, always present to some extent in bromine of commerce. A simple test to show approximately how much is present, proposed by the German Pharmacopœial Commission, is as follows: "1 cc. of a solution of 1 gm. of bromine in 29 gm. of water is diluted with water to 10 cc., 3 cc. of ammonium carbonate solution (1 part ammonium carbonate, 3 parts water, 1 part 10 p. c.-ammonia water) are added, then 6 cc. of n/10 silver nitrate. The mixture is shaken briskly and filtered, then acidulated with nitric acid of about 25 per cent. A very slight opalescence and no formation of a deposit in 1 hour indicates presence of about 1 per cent. of chlorine; a moderate opalescence and a deposit after half an our about 2 per cent.; a decided opalescence, but still translucent liquid and a deposit of flakes after 2 or 3 minutes about 3 per cent.; an opaque mixture, beginning to form flakes at once, 4 per cent. or more." The test should be made in tubes of about 2 cm. diameter. An improvement of the iodate method for exact determination of chlorine in presence of bromine is given by L. W. Andrews in *Jour. Am. Chem. Soc.*, v. 25, p. 756.

CAFFEINA.—Products of representative sources do not contain more than 0.1 per cent. of non-volatile matter. The requirement that caffeine should produce colorless solutions with concentrated sulphuric or nitric acid, is hypercritical, but about 0.5 gm. should dissolve in 5 cc. of either sulphuric or nitric acid without producing more than a slight yellowish color.

CAFFEINA CITRATA.—Several additional tests are required to establish purity and correct composition. Residue on incineration should not exceed 0.1 per cent. A saturated water-solution should stand the U. S. P. time-limit test for heavy metals. A 1 per cent. water-solution should remain clear 5 minutes after addition of barium chloride. It should not yield less than 49 per cent. of anhydrous caffeine by the following test: About 0.5 gm., dried to a constant weight at 80° before weighing, is dissolved in 10 cc. of warm water, an excess of caustic soda solution added and the cooled mixture shaken with 3 portions of 20, 10, and 5 cc., respectively, of chloroform. The combined chloroform extracts are evaporated to dryness and the residue dried to a constant weight at 80°. In the U. S. P. solubility test (2d paragraph of small type) separation usually does not take place for several hours after dilution with 5 parts of water, unless the liquid is cooled to a low temperature.

CAFFEINA CITRATA EFFERVESCENS.—It should yield not less than 1.95 per cent. of anhydrous caffeine, when about 5 gm. are assayed by the method given above.

CALCII BROMIDUM.—The U. S. P. tests are not sufficient to determine if the salt contains the required 97 per cent. of Ca Br_2. Among impurities not provided for, it may contain much chloride, a little sulphate, and also magnesium and alkali salts. For an exact determination of the actual Ca Br_2 contents quantitative determination of calcium and of bromine would be required, but for practical purposes it is usually sufficiently exact to determine the chloride, after the salt has been rendered anhydrous at about 180°, by precipitating bromide and chloride together as silver salts, then making an approximate separation of the two by means of a limited quantity of ammonium carbonate solution (see test for chlorides under ACIDUM HYDROBROMICUM, U. S. P., p. 13). The impurities in the products of reputable makers are usually so well within the U. S. P. limits, that quantitative determinations are not required.

CALCII CARBONAS PRAECIPITATUS.—The test for "limit" of iron, aluminum, and phosphates practically requires *total absence* of these impurities. Additional tests are needed to ascertain presence of the required 99 per cent. of $CaCO_3$, as the salt may contain chloride, sulphate, magnesium and alkali salts. A volumetric determination of calcium is readily made by dissolving the salt in hydrochloric acid, expelling carbon dioxide by boiling, then adding an excess of ammonia water and precipitating with volumetric oxalic acid. The excess of oxalic acid is titrated in an aliquot part of the filtrate with permanganate (for details see Fresenius, Quant. Anal.). In doubtful cases, e. g., when a considerable quantity of calcium sulphate or chloride is present, a carbon dioxide determination may be necessary.

CALCII CHLORIDUM.—When "rendered anhydrous by fusion," as specified by the U. S. P., the salt undergoes decomposition sufficiently to acquire an alkaline reaction, while it is required to be "strictly neutral." A nearly anhydrous, neutral salt is made at a lower temperature in granular form. A limit of 0.1 per cent. of magnesium and alkalies is equivalent to requiring a purity of practically 99.9 per cent., instead of 99 per cent. as specified, as magnesium is the chief impurity in calcium compounds not readily removed. Determination of calcium (by the method indicated above or other suitable method) would make a test for magnesium and alkalies superfluous.

CALCII HYPOPHOSPHIS.—The test for "absence" of phosphate and sulphate will not detect traces of these, nor can absence of phosphate be demanded in a salt that is subject to atmospheric oxidation with formation of phosphite and phosphate. No method is provided to determine presence of 98 per cent. of Ca $(PH_2O_2)_2$. The permanganate method of the U. S. P. of 1890 has been criticised as being unreliable because of interference of sulphites, thiosulphates, phosphites and phosphates. Although theoretically the presence of these substances should cause the results to be too high, experience has shown the tendency of the method towards too low results. Sulphites and thiosulphates are not now found in the commercial product and all except traces of phosphite and phosphate may be eliminated by adding an excess of lime water to a water-solution of the salt and applying the permanganate method to the filtrate. For more exact determinations it is preferable to precipitate phosphite and phosphate with lead acetate,

oxidize the hypophosphite in the filtrate with nitric acid and determine it by the usual methods as phosphate.

CALCII PHOSPHAS.—The test for barium, as given, is far from being sensitive enough to prove "absence" of it. Strong acidulation with nitric acid effectually prevents precipitation of decided traces of barium sulphate. A better way would be to use barely enough nitric acid to bring the salt in solution, add the potassium sulphate, and let the mixture stand for some hours. If a precipitate is formed, it should be readily and completely dissolved by further addition of nitric acid. Some specimens of this salt have been found to respond to the U. S. P. test for excessive quantities of arsenic, when actually the arsenic present was well within U. S. P. limits. The samples, when boiled with silver nitrate solution, gave evidence of containing traces of some impurity capable of reducing silver, assumed to be phosphite, which, on conversion to phosphine during the test for arsenic, would produce a yellow spot similar to that produced by arsine. After a preliminary treatment with nitric acid, as directed in the U. S. P. for hypophosphites, no reactions for arsenic were obtained. When the salt contains more than traces of magnesium or of sulphate, quantitative determinations of either calcium or phosphoric acid, or of both, may be required, to ascertain if a minimum of 99 per cent. of $Ca_3(PO_4)_2$ is present.

CALX CHLORINATA.—A committee on Standard Specifications of the *Am. Chem. Soc.* proposes requirements as follows: It must be white, fresh, and dry, must contain not less than 31 per cent. of available chlorine, and must settle readily and completely when mixed with water; if lumps are present, they must break down and leave no core. Analyses are to be made by Penot's method, by adding an excess of n/10 sodium arsenite and titrating excess with n/10 iodine (Sutton's *Volumetric Analysis*, 10th ed., p. 177). Further details are given in *Jour. Ind. & Eng. Chem.*, 1911, v. 33, p. 861. The U. S. P. method of assay has the defect that any chlorate present is included in the determination. By acidulation with acetic acid, according to Bunsen, instead of hydrochloric acid, more accurate results may be obtained by the U. S. P. method.

CALX SULPHURATA. The semi-quantitative test intended to show presence of at least 55 per cent. of calcium sulphide has been found by J. Rosin to give results much too low, chiefly because of interaction between the sulphide and sulphite, which is always present. By methods involving removal of sulphite before determination of the sulphide, a recent sample was found to contain 58.5 per cent. of Ca S., when the U. S. P. test indicated presence of less than 55 per cent.

CAMPHORA.—No pharmacopœia, so far as the writer is aware, has as yet admitted synthetic camphor, although it is claimed in various quarters to be therapeutically equivalent to the natural product. Borisch's test, as given in the Swiss Pharmacopœia, to distinguish natural from artificial camphor, is based on the presence of some characteristic impurity in the former. About 0.01 gm. of camphor is stirred with a few drops of a 1 per cent. solution of vanillin in concentrated sulphuric acid. Natural camphor gives a yellow color, changing to red, violet, and blue. Synthetic camphor gives no colors. The German Pharmacopœia states the specific rotatory power of a 20 per cent. solution of pure natural camphor in absolute alcohol to be $+44.22°$ at 20°. A specimen of a synthetic

product was recently found to have a specific rotation of about +15°. It is usually stated that synthetic camphor is optically inactive. According to the French Pharmacopœia camphor should make a clear solution in benzene, to show absence of more than traces of water. The test also shows presence of inorganic impurities of various kinds. Non-volatile matter should not exceed 0.05 per cent.

CAMPHORA MONOBROMATA.—While this substance dissolves in concentrated sulphuric acid without decomposition, as stated, the solution has a decidedly yellow color, which is not stated. This color may be erroneously considered to indicate presence of impurities. It disappears when the solution is poured into water. G. A. Menge reported 5 commercial specimens to melt between 74.8° and 76.2°. On the basis of examination of 36 samples adoption of a melting range of 74° to 77° seems advisable. Non-volatile matter should not exceed 0.05 per cent. It should be nearly free from water-soluble halogen compounds, as shown by shaking about 0.5 gm. of the powdered substance with 10 cc. of water. The filtered liquid should be neutral to litmus and show not more than a slight opalescence on addition of silver nitrate.

CARBO ANIMALIS PURIFICATUS.—The test for limit of ash should be made with the dried substance or the calculation made on the basis of the dried substance. It should not lose more than 5 per cent. in weight when dried 2 hours at 100°. No limit of moisture is now required. The following additional tests are also recommended: When boiled with 100 parts of water, 10 cc. portions of the filtered water should not be made turbid at once by barium chloride or silver nitrate. On heating to boiling about 1 gm. with 20 cc. of water and 1 cc. of diluted hydrochloric acid, the filtered solution should not respond to thte U. S. P. time-limit test for heavy metals.

CARBO LIGNI.—In addition to the U. S. P. requirements, it should meet the following: Dried 2 hours at 100° it should not lose more than 5 per cent. in weight. When dry, it should burn without a luminous flame and leave not more than 5 per cent. of ash.

CHLORALUM HYDRATUM.—Much confusion exists as to the melting point, which is an important test of purity. This is illustrated by the figures of several pharmacopœias and other authorities: 58° (French, Japanese, Austrian); about 58° (U. S., Belgian); 53° (Swiss); 47° (Spanish); softens at 49°, completely melted at 53° (German); 51°, when pure (P. Siedler); 49° to 51°, when pure (M. Lefeldt). Formerly the products in this market melted at 58° or a few degrees lower, but more recently most samples tested have melted at 53° or but little higher. A commercial sample recently examined, after drying over sulphuric acid, softened at 49°, began to melt at 50°, and was completely melted at 53°. It conformed in other respects to the U. S. P. standard, stood the former U. S. P. nitric acid test, as well as the iodoform test, for alcoholate, and assayed 99.9 per cent. by a method described below. The same sample, when recrystallized from benzene, softened at 49°, began to melt at 50°, and was completely melted at 51°, corroborating the figures given by Siedler and Lefeldt. A melting point higher than 51° is probably due chiefly to presence of butyl-chloral hydrate (m. p. 78°). The U. S. P. requires a freshly prepared water-solution of chloral hydrate to be neutral to litmus, but it was pointed out by Schering many years ago that such solutions

always have a slightly acid reaction. This has often been verified since then. The test for chloride is faulty, as the pure substance very soon liberates hydrochloric acid in water-solution, but an alcohol-solution (1 in 20) should not at once redden moistened blue litmus paper nor should it become opalescent at once on addition of silver nitrate. Non-volatile matter should not exceed 0.05 per cent. The U. S. P. has no test for alcoholate, that with nitric acid, given in the first printing in 1905, having been cancelled in 1907. This test is now official in several of the important, more recently published pharmacopœias. Statements have been made that the nitric acid test is misleading and unnecessary, as the presence of alcoholate would be shown by the melting point, but it appears that the correct melting point of chloral alcoholate has not yet been definitely ascertained and the publishd figures for it are rather near to that of chloral hydrate itself, being 56° (Jungfleisch) and 46° (Lieben), as quoted by Beilstein. The writer can find no fault with the nitric acid test as it was given originally in the U. S. P., VIII, as follows: If 1 gm. of Hydrated Chloral be placed in a porcelain dish and covered with 1 cc. of nitric acid (sp. gr. 1.38), no yellowish coloration of the mixture should be produced at ordinary temperature, or even after warming the mixture 3 or 4 minutes, nor should yellowish fumes be produced after 10 minutes' warming. The Swiss Pharmacopœia requires a purity of 99.5 per cent., by the following method: About 4 gm., accurately weighed, are dissolved in 10 cc. of water, then 30 cc. of n/1 caustic alkali added and the mixture allowed to stand exactly 2 minutes. The excess of alkali is at once titrated with n/1 acid, with phenolphthalein as indicator. Each cc. of n/1 alkali (O = 16) consumed corresponds to 0.1654 gm. of $CCl_3COH + H_2O$. Market products at the present time test from 99.5 to 100 per cent. by this method. It is important to adhere closely to the specified conditions of time and concentration for reliable results. It should be taken into consideration also, that the impurities most likely to be present also neutralize alkalies under the conditions of the method, and that, therefore, the results are of value only for corroboration of the results of other tests and for detecting excessive quantities of water.

CHLOROFORMUM.—The specific gravity (1.476 at 25°/25°) does not accurately correspond to a maximum alcohol content of 1 per cent., as intended. It corresponds more closely to the minimum content of 0.6 per cent. To insure presence of alcohol within these limits, the specific gravity at 25°/25° should be not less than 1.473 nor more than 1.477. A higher specific gravity may indicate either that alcohol is not present in sufficient quantity for effectual preservation or that a liquid having a higher specific gravity than chloroform, such as carbon tetrachloride, is present. Determinations should be made with a pyknometer of verified accuracy, of the type described under AETHER. A boiling point determination is of little value for ascertaining the purity of chloroform. A few tests in addition to those of the U. S. P. may be of value. No weighable residue should remain on evaporation of 20 cc. from a platinum or porcelain dish and drying the dish at 100°. Presence of carbon oxychloride would be shown, according to various foreign pharmacopœias, by a suffocating odor of the sample. However, it is never found in chloroform that stands the U. S. P. sulphuric acid and silver nitrate tests. The barium hydroxide test, U. S. P., 1890, was directed principally against this impurity, but was dropped at the last revision because of its unre-

liability, pure products often failing to comply with it. It has lately been proposed again by C. Baskerville. As carbon tetrachloride has for some years been a source of manufacture of chloroform, contamination of the product with this is possible. No reliable simple test for it has yet been devised, but determination of the specific gravity, after removal of alcohol and water, should show its presence. To remove alcohol, about 50 cc. of chloroform should be shaken with successive portions of 10 cc., 10 cc., and 5 cc. of concentrated sulphuric acid, the chloroform then neutralized by shaking with a solution of alkali carbonate, then dehydrated by shaking occasionally for half an hour with about 5 gm. of anhydrous potassium carbonate or calcium chloride, decanted and distilled. The first portion of distillate should be perfectly clear to show that water was completely removed. The specific gravity of the distillate should not be higher than 1.4848 at 25°/25°. That of carbon tetrachloride is about 1.60. Chloroform of U. S. P. standard, after removal of alcohol and water, had a specific gravity of 1.4846. Another portion of the same specimen, to which 2% by volume of carbon tetrachloride was added, and which was then treated for removal of alcohol and water, had a specific gravity of 1.4858. A test for acetone in chloroform is desirable. A reliable and sensitive test consists in shaking 5 cc. of chloroform with 5 cc. of water. To the separated water 2 cc. of sodium hydroxide solution (5 p. c.) and 5 drops of a freshly made water-solution of sodium nitroprusside (1 in 50) are added and the mixture made slightly acid with acetic acid. No violet tint should appear.

CHROMII TRIOXIDUM.—The U. S. P. requires that when it is decomposed by heat, the residue obtained "should yield nothing soluble in water." This is too exacting, as other pharmacopœias allow from 0.5 to 1 per cent. of alkali chromate. The test for sulphuric acid does not show "absence" of it, even when no turbidity is produced after long standing. Not only the dilution, but also addition of "a few cc." of hydrochloric acid prevent detection of traces, but the test is quite delicate enough for detction of objectionable quantities of sulphuric acid. Enough hydrochloric acid should be added to prevent precipitation of barium chromate.

(To be continued.)

THE ART OF FLAVORING.*

JAMES CROMBIE, PH. C.

I fear that the title of this paper is somewhat misleading. It is not my intention to enumerate the main flavoring agents and to show you how such may be applied individually or in combination to form pleasing and palatable preparations of things that are otherwise, but rather to advance a suggestion or theory whereby flavoring as an art may be better understood, and some system devised which will guide us in our selection of flavors and in the making of flavor combinations. Not only has your several discussions on the flavor or aroma of B. P. waters suggested the subject to my mind, but the many very fine flavored preparations—

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often of proprietary origin—which are finding much favor, both with prescribers as well as patients, have awakened the need there is on the part of the individual pharmacist to cultivate the art of flavoring on some system rather than on the present rule-of-thumb methods which, to say the least concerning them, are too haphazard. To understand the matter fully it is necessary to introduce an aspect of the subject which at first sight may seem foreign to this paper, but which, in a fuller light, I feel sure, will prove an essential, viz.: The physiology of taste and smell. You will here note that taste and smell are two distinct senses, the one felt in the mouth by the tongue and the other in the nose by the olfactory epithelium. But most physiologists give flavor as simply smell, and describe it entirely apart from taste. While this may be perfectly correct physiologically, we cannot, from a pharmaceutical point of view, entirely separate the two. To illustrate, we would never think of supplying a sour taste with the same flavor as we might a sweet taste. A lemon flavor would run with an acid, while a cinnamon would be more agreeable to a sweet. While making this proviso, allow me to return to the physiology of the subject. First in a general way, and secondly with more particular attention to the organs under review. *General.*—Any cause that provokes a nerve to action is called a stimulus, and the evidence of that stimulation may be felt as a sensation either pleasing or otherwise. All appreciable qualities of objects in the surrounding world are natural stimuli at the sensory periphery, and these natural stimuli are the physical qualities of objects that excite, as smell, sight, hearing, taste, etc. *Particular.*—The principal nerve of taste is the glosso-pharyngeal, which supplies the posterior part of the tongue—*i. e.*, that portion of the buccal surface which most contributes to taste. Two other nerves also take part in taste. These are the so-called gustatory branch of the fifth, which is a common sensory nerve, and the chorda tympani of the seventh. The nerve ends by which taste excitation are considered to be received are the taste bulbs. Each taste bulb is an oval body formed of long fusiform cells arranged in cortical and medullary groups. Tastes may be classified into (1) sweet, (2) bitter, (3) acid or sour, (4) salt. It has not been decided whether alkaline and metallic tastes are elementary. The substance to be tasted must be dissolved; here there is a striking contrast to the sense of smell: flavor is really odor. Further, the solutions to be tasted should be about the temperature of the body, as then the sensation is more readily felt—on an average in about one-fifth of a second. It would seem that specific tastes have specific nerves, for different parts of the tongue are more sensitive to certain tastes than others; the back to bitter, the tip to sweet and salt, the sides to acid, the middle to hardly any. Cocaine applied to the tongue in increasing doses is said to abolish sensation of all kinds in the following order: General sensibility and pain, bitter taste, sweet taste, salt taste, acid taste, tactile sensations. When diluted sweet and salt solutions are simultaneously applied to the tongue, they tend to neutralize one another, but a true and definite point is difficult to reach. Sweet and bitter, sweet and acid liquids are antagonistic to a similar but less perfect extent. The delicacy of the sense of taste is shown by the power to detect one part of sulphuric acid in 1000 of water. Quinine, common salt, and sugar are less easily detected, but in the order given. Chewing the leaves of an Indian plant, *Gymnema Sylvestre,* destroys the sensibility to bitter and sweet, but leaves

the power to discern acids and saline bodies. The union of taste and smell is said by one writer on the subject to give rise to the composite sensation termed the flavor of a substance, while all the others consulted entirely separate taste from flavor, and describe the latter under smell. This may be the true philosophy of the subject, but, as already noted, it is impossible for us, as pharmacists, to separate the two entirely. The manner in which smell is conveyed is variously described. One writer says: "Odoriferous particles carried in the inspired air into the lower nasal passages pass by diffusion into the upper chambers, and, coming into contact with the olfactory epithelium, give rise to the sensation of smell." Another states that it is necessary that odorous substances should be in a gaseous state in order to act on the olfactory epithelium. A third, Ramsay, has advanced the theory that the sense of smell is excited by vibrations of a lower order than those which give rise to the sense of light or heat, and he points out a series of important facts in support of this view. He states that to produce the sensation of smell a substance must have a molecular weight at least fifteen times that of hydrogen. For instance, the specific gravity of marsh gas is eight—no smell; of ethane, fifteen—faint smell; of propane, twenty-two—distinct smell. Haycraft, assuming the correctness of Ramsay's hypothesis—that smell depends on the vibratory motion of odorous particles—has endeavored to show that the quality of the sensation depends on the kind of vibration producing it. He has also traced a correspondence between the character of the smell and the position of the body producing it in the groups in which Mendelejeff has arranged the elements to illustrate the periodic law. When we remember that smells can be filtered through cotton wool without loss of pungency, the theory of odoriferous particles exciting the nerves falls somewhat short. And, again, that odorous matters of animal effluvia, etc., are of a higher specific gravity than the air, and do not readily diffuse, upsets the general application of the gaseous theory. Here we are left with the vibratory theory of Ramsay, which may be applied without exception to all emanations. And it becomes the more likely when we think how the forces sound, light, and heat are transmitted. This, then, brings me to my theory, or suggestion, for a better understanding of smell or flavor. Having admitted that the sense of smell is conveyed by vibration, it appears quite feasible to draw a parallel between smell and sound. If certain sound waves produce certain notes, then certain smell waves must produce certain odors. In music we have scales of notes, in which every musical sound has a place, and to the trained ear of a musician very fine gradations of sound may be determined. Why, then, should we not have an odorous or flavoring scale drawn up and clearly defined, to which all odors may be compared? Again, we might learn, as in music, that certain notes or flavors may not run together, in other words, will not harmonize, but will produce discords. Another way it might be shown that, as in music, all flavor combinations must be on the same key. One might well imagine such flavors as liquorice giving low notes on the scale, while higher up might be placed cinnamon, almonds, nutmegs, and still higher eucalyptus, thymol, menthol, etc.; and perhaps at the top ethereal flavors, as pineapple, pear, raspberry, etc. One difficulty suggests itself—*i. e.*, the selecting of simple or elementary flavors to form notes on the scale, most flavors, even those derived from a single source, being of a composite nature. The foregoing and many other

similes might be drawn between music and flavor by those better versed in the theory of music. There is one point of special importance to pharmacists, that which might be termed the psychology of flavoring. If a preparation has a pleasing appearance, the person taking it may be predisposed towards it, and will naturally seek for a pleasant flavor, and, if present, will appreciate it to a greater extent than he would if it looked dull and uninviting. Just fancy a connoisseur of good wine seeking to roll upon his tongue a wine of miserable color and muddy appearance! This, then, forms my theory or fantasy on flavoring, and though it may be more in the nature of a dream than a reality, still I hope it may serve the purpose of awakening in some greater mind the possibility of some system which will guide us in the art or science of flavoring.

DISCUSSION.

Mr. Boa said this was a very suggestive paper. It was well to have some definite principle to go upon in flavoring. In regard to perfumery it was interesting to note that if, for example, they put a drop of oil of eucalyptus on blotting paper and shook it, they would observe a series of different odors coming off in stages, thus indicating that all essential oils were a complex combination of different odors. Again, it would be found that if two perfumes, having nothing in common, were mixed, the result would not be agreeable. Another point to be observed was, and he thought this a principal consideration in the building up of perfumes, that odors diffused at different rates. If they put a few drops of one perfume at the corner of a room, for example, the odor would be perceptible at the other extreme much earlier than in the case of some other perfume placed in the same position at the same time. This had to be borne in mind when, in blending perfumes, they were endeavoring to back up one by the addition of another. In such cases it was necessary to select perfumes which diffused at the same rate. Culinary flavors, such as lemon, orange, or vanilla, were generally of a simpler nature than those found in perfumes. The sense of taste and the sense of smell seemed to be closely related. He knew a man engaged in the drapery trade who was accustomed to buy and sell perfumes, but he was almost destitute of the sense of smell. Nevertheless, he could select perfumes by the curious method of allowing a little to trickle down the throat. He thought Mr. Crombie should follow up the interesting suggestions he had made, and embody the results in a future communication. It seemed not unlikely that, as the result of experience, and probably unconsciously, those accustomed to obtain any desired flavor, really did so by proceeding on such lines as Mr. Crombie indicated.

Mr. Henry said he had noticed that in the B. P. Codex, an otherwise excellent publication, the formulæ seemed frequently to fail, because of the flavor being unsatisfactory. In the case, for example, of the syrup of glycerophosphates, it is spoilt by the harshness of the taste. In this respect it differed from the proprietary articles. Possibly, this might be due to the fact that the B. P. Codex preparation contained a larger proportion of glycerphosphates. He thought Mr. Crombie had done the craft a service by this ingenious suggestion.

Mr. Merson said those who had experience in the making of palatable preparations, had been accustomed to reach a result by a rule-of-thumb method, and it would be an advantage to have some definite system instead.

Mr. Somerville said the question of flavoring with certain medicaments was important. He had often heard it said that a mixture containing quinine flavored with syrup of orange was a fraud. The agreeable odor of the orange, and the sweetness of the sugar were speedily replaced by the bitterness of the quinine. If they could hit upon a flavor which would mask the quinine bitterness in the pleasing odor and sweet taste of the sugar, it would be an advantage. It was often said by those who took Gregory's Powder, that if it was mixed and handed to them by another person, it was more easily taken, because they had not time to perceive the nauseous odor which was so evident when they had themselves to mix it with water.

Mr. MacPherson said he thought Mr. Crombie had omitted the chief point suggested by his paper, namely, a definite scale for flavors. His recollection was, that this was an idea that was made much of by Mr. Piesse, and Mr. Crombie might get some useful hints from his published book on perfumery.

Mr. Rowland said it would not be so easy to get a scale of odors from natural products, each of which represented rather a chromatic scale. A better plan would be to begin with some of the coal tar products which could be separated by fractionation, as was done even already in the case of many of the essential oils. By collecting these fractions together, they might be able to hit upon a scale.

Mr. Hill said the title of Mr. Crombie's paper would have been more accurate if he had called it not "The Art of Flavoring," but the "Science on which the Art of Flavoring is Based." What he had said was suggestive, but only preliminary, and he hoped Mr. Crombie

would follow the matter up and give a subsequent communication setting up something like a definite practical scale.

Mr. Tait said, taking the analogy of music, a novice could play a scale on a piano, but it would be destitute of that quality which would be imparted to it by a highly trained pianist. The same was even more noticeable in the production of a vocal scale. In the same way they might draw up a scale of flavors according to the science of flavoring, but the art of flavoring was something more that could only be reached by training and experience.

Mr. Crombie, in replying, said it was difficult to draw up a scale, and, certainly they would have to begin with some of the elementary odors. In the case of a preparation like cod-liver oil emulsion they might have two classes of flavors, the ethereal odor being the first perceptible, and some heavier odor towards the last, so as to mask the flavor of the cod-liver oil. With regard to distinguishing perfumes by swallowing them, it had been stated that the nostrils could be filled full of such a thing as eau de Cologne without perceiving any odor, but if air bubbles were admitted the odor was immediately perceptible. This seemed to suggest that in order to produce the sense of smell the substance must be in a gaseous or suspended form. Flavoring was very frequently completely overdone, and he thought that in this country we were much behind. The Americans excelled in giving just that amount necessary and no more. In preparations such as cod-liver oil emulsion he sometimes found as much as a drachm of oil of almond or oil of cinnamon to a gallon of emulsion, which was quite excessive. Six drops to the gallon was ample for flavoring purposes. Recently he had been asked by a hairdresser to supply him with something possessing the distinctive odor of a hair preparation. At first he was puzzled, and then imagined that he had tasted the same odor. On reflection, he remembered that his impression was associated with some liquorice pastilles which he had tasted, and, when tasting, had perceived the odor. Syrup of orange was quite insufficient as a flavoring agent for covering the taste of quinine. They required something very much heavier, such as liquorice. In regard to taking Gregory's Powder, it was well known that by simply holding the nose a person would find the swallowing of Gregory's Powder quite an easy matter.

THE INFLUENCE OF HYDROGEN PEROXIDE ON THE AROMATIC COMPONENTS OF MOUTH-WASHES.

(Notes from the Laboratory of E. Sachsse & Co., Leipzig.)

As hydrogen peroxide has, besides disinfecting, very vigorous oxidizing propensities, it is obvious that it has a deteriorating influence on all essential oils, etc., which have easily oxidizable constituents, such as alcohols, aldehydes, etc.

It is, therefore, of importance to every manufacturer of dental and similar preparations to know which essential oils and other aromatic products are influenced by hydrogen peroxide, and which remain unchanged.

The table below will show this.

The hydrogen peroxide solutions used were made as follows: 0.05 oz. aromatic substance (essential oil or chemical) were mixed with 40 ozs. alcohol 55 overproof, 30 ozs. water, and 25 ozs. of a 12 percent solution of hydrogen peroxide. These mixtures were left two months in stoppered brown bottles, and then compared with similar freshly-prepared mixtures.

The Aromatic Substance Employed.	*Remarks on the Taste and Character of the Solutions after two months.*
Oil of almonds freed of prussic acid	Turned entirely to benzoic acid
Anethol Oil of aniseed tsf. "Sachsse" Oil of star aniseed tsf. "Sachsse"	Unchanged
Bornylacetate	Unchanged
Carvacrol	Weaker than the fresh solution
Cinnamic aldehyde	Entirely oxidized, insipid taste, not a trace of cinnamon flavor left
Oil of cloves tsf. "Sachsse" Eugenol	Slightly changed—the taste of the fresh solution is more agreeable.
Oil of caraway seed tsf. "Sachsse" Carvol	Unchanged, only slightly weaker

Oil of cognac Oil of cognac tsf. "Sachsse"	Unchanged
Eucalyptol Oil of eucalyptus tsf. "Sachsse"	Unchanged
Geraniol	Greatly changed, taste insipid and fusty
Oil of geranium Spanish tsf. "Sachsse"	Slightly weaker, otherwise unchanged
Oil of lemon	Greatly changed, taste insipid, soapy
Oil of lemon tsf. "Sachsse"	Weaker, and has lost the true lemon character
Oil for marasquino	Weaker, but otherwise not much changed
Menthol	Greatly changed, the refreshing flavor of menthol disappears entirely
Menthylacetate	Greatly changed, the refreshing flavor of menthol disappears entirely
Oil of neroli Oil of neroli tsf. "Sachsse"	Weaker, but otherwise unchanged
Oil of orange, bitter Oil of orange tsf., bitter. "Sachsse"	Slightly weaker, but otherwise unchanged
Oil of orange, sweet Oil of orange, tsf., sweet. "Sachsse"	
Oil of peppermint (all qualities)	Falls off entirely
Oil of pine (all qualities, tsf. "Sachsse")	Unchanged
Terpineol	Slightly weaker, but otherwise unchanged
Thymol	Entirely changed; sour flavor
Vanillin	Unchanged

The preceding results prove that hydrogen peroxide—

(1) Destroys entirely the flavor of oil of almonds, cinnamic aldehyde, geraniol, oil of lemon natural and tsf., menthol, menthylacetate, oils of peppermint, vanillin.

(2) Weakens the flavor of carvacrol, oil of cloves tsf., eugenol, oil of caraways tsf., carvol, oil of cognac natural and tsf., oil of geranium Spanish tsf., oil for marasquino, oil of neroli natural and tsf., oils of orange bitter and sweet natural and tsf., terpineol.

(3) Has no influence whatever on the flavor of anethol, oil of aniseed tsf., oil of star aniseed, tsf., bornylacetate, eucalyptol, oil of eucalyptus, tsf., oils of pine tsf., thymol.

FROM "THE PERFUMERY AND ESSENTIAL OIL RECORD."

SOME OF THE BEAUTIES OF PHARMACY.

WILLIAM C. ALPERS, SC. D.

It has always been one of the greatest pleasures of my life to spend an hour among students. I like the atmosphere of the school room. There is something animating and refreshing about it. I feel tonight like a wanderer who had lost his way and suddenly sees his home in the distance, and I therefore consider it a great privilege to be with you and address a few words to you. If there were anybody in this world whom I might envy his position it is the teacher. I do not know of any occupation that is more apt to elevate than that of teaching, because there is the continuous influence from the young, the continuous emanation of the youthful spirit, the continuous contact with all that is impulsive, beautiful, cheerful, and ideal. The ardent desire of my own life to be a teacher and live among the young and remain young with them has not met with fulfill-

*Address delivered before the Students' Chemical Club, Princeton University, April 25, 1912.

ment, and I will probably remain a poor business man to the end of my days. But perhaps on this account I enjoy a short stay among students the more, and it seems to me that the spirit with which your hearts are filled, the spirit of unlimited confidence in your own strength, the spirit of unblighted hope in a bright future, the spirit of pure and noble optimism—in short, the spirit of idealism—comes from you to me as a good, dear old friend, and seems to give me a new lease of life.

Starting out with such words it seems to be difficult to come to the subject that has been assigned to me, Pharmaceutical Chemistry, and combine this study, which is supposed to be a dry and uninteresting one, with the lofty flight of my thoughts when I look into your faces. Yet I can assure you that, if practiced in the right way, there is perhaps no science that will lead the professional man into broader and wider fields of thought than can pharmacy. Pharmacy is generally considered a rather insignificant part of chemistry. It might be called a step-daughter who is allowed to run behind the others. The reason for this is probably because pharmacy is not a science in itself, but takes a little from quite a number of other sciences, and puts these different parts together, trying to make a dignified looking coat out of the many-colored patches. We have to know more or less of botany, microscopy, bacteriology, therapeutics, materia medica, surgery, physics, chemistry, and commercial sciences, and be skillful in manual work of various kinds, in order to be called pharmacists. I do not know if any of you ever had the idea of going through a course of chemistry to engage in pharmacy, perhaps not. Perhaps you think it is below your dignity, perhaps you think there is not enough reward in it. Unfortunately, too, professional pharmacy in this country is covered up, and hidden under, a conglomeration of foreign interests that catch the eye of the thoughtless, and make many people believe that there is nothing great behind it. Pharmacy, if practiced in a thoughtless, mechanical way, is indeed a drudgery, like any occupation where the worker allows himself to become a machine, continually nagging at everything around him and bewailing his own misfortune, thinking he is destined to be something better. It is impossible for me, in the few minutes that are at my disposal, to tell you all the beauties, the possibilities, the broadness, of my profession. But by way of illustration let us only go through one little prescription that any physician might order for you in the case of a cold. This prescription consists of five ingredients: Syrup of Ipecac, Syrup of Squill, Ammonium Chloride, Codeine Sulphate, Syrup of Wild Cherry. A common prescription, as it is prepared in every pharmacy almost every day. The thoughtless druggist takes down one bottle after another, measures so many cubic centimeters or drams, weighs so many grains or centigrammes, and that is the end of it. Then he goes to the next piece of drudgery, as he calls it.

But let us look at this prescription in a different light, let us follow each ingredient to its source and see what possibilities there are for instruction and enlightenment.

IPECAC—Where do we get it? Our mind at once takes a trip south. We land in the jungles of South America, we see the wily natives, the descendants of the Incas, who know the value of this precious root. Their forefathers knew it before white man set foot on this continent. They pick it secretly, wash it,

pack it in bundles, and carry it on their heads to the nearest trading station. We would like to roam through the beauties of these virgin forests, we admire the brilliant colors of the birds, the insects, the flowers, that seem to allure us into the dangerous thickets. But we pass on to the second article.

SQUILL—What is it? It is the bulb of a plant growing on the coast of the Mediterranean Sea. We fly across the Atlantic, quicker than an areoplane, and arrive in Italy and Greece. Here we find the plant that at the time of Herodotus was known as a valued medicine. In our minds we take a side trip to the Colliseum at Rome. We walk in amazement through the halls of the Vatican and the great museums of Italy, where the treasures of mediaeval art rival the wonderful relics of antiquity. Or we climb the hills of the Parthenon and recall the time of Athens' greatest power and civilization. But we have no time for these reminiscences. We come to the third article.

AMMONIUM CHLORIDE—What a number of thoughts press on our minds at once if we follow this chemical into its details and into its sources. It is impossible to express them all. Let us only consider one thing, the name derived from the Oasis of Jupiter Ammon. So we cross the Mediterranean Sea and arrive in the land of the Pharaohs. At the time of the old Egyptians the caravans through the desert made their first stop at the Oasis and worshipped their god, Ammon. Here, from the piles of accumulated refuse from the camels, under the influence of the tropical sun, the first Ammonia gas was generated, and some Ammonium Chloride found, which in those days was considered a valuable salt of miraculous powers. Thus our trip takes us to the Pyramids, and in awe and admiration we look up to the Sphynx. We would like to enter deeper into the dark continent and explore its flora and fauna. But pressure of time takes us further.

CODEINE SULPHATE—An alkaloid of opium. We leave Egypt and cross over to Asia Minor. We cast a glance at the field when in olden times the great city of Troy flourished. We think of the beautiful Helen and the deadly fight between Hector and Achilles. Then we admire the modern fields of poppies with their bright flowers, cultivated by the Armenians. We pass through the valley of roses of Cashmere and Persia, we see the wonders of India, and stop in our journey in China, watching the planting, cultivation, gathering and preparation of this drug. As we stop to look we revel in the beauties and marvels of Oriental civilization—but we must go on. The last article in our prescription is Syrup of Wild Cherry.

WILD CHERRY—It sounds like home, it brings us back to America. In a second we cross the Pacific Ocean, and arrive again in our own land, where from the coast of the Atlantic west to the Mississippi this useful tree abounds.

Thus you see, guided by the chart of this little prescription, I have taken you on a trip around the world. But only a hasty trip. I could have stopped for hours at each station and told you about the article that we looked for there. I could have spoken of the discoverers, pioneers, and botanists that discovered the plant, that cultivated it, described it—of the number of chemists that worked for hours, for years, some of them for a lifetime, at the determination of the various active principles of these plants. I could have dwelt on the development of the industries that produce the chemicals; I could have mentioned the

great number of physiologists and medical men that, in thousands and thousands of experiments, by faithful study and work, discovered, described, and determined the action of these drugs on some part of the human system. And then we can go over the greater enterprises from the perscription. Then we have the sugar, from which the syrups are made, reminding us of one of the greatest chemical industries. We need the bottle, the glass, which takes us to another extensive industry. Nor is this all. When a teaspoonful of this medicine is given by a loving mother to her feverish child, what amount of labor and thought does this teaspoonful represent! In every continent of the earth someone had to do some kind of work to contribute to it. From the lowest class of human beings, the coolies in China, to men of the highest intelligence, there is some trace of work in that dose of medicine. Such a thought makes us realize how closely related all men are, how under the influence of higher civilization all mankinds approach each other to one large family, and we realize that our ultimate happiness can only lie in steady and patient dissemination of knowledge, that will make all men acquainted with and respect each other, and bring them closer together. Not armies and dreadnaughts, the arresters and destroyers of the achievements of civilization, but mutual respect and friendship will make for our ultimate welfare.

But let us come back to our little prescription and realize that the pharmacist who goes at his work in the right spirit can derive keen enjoyment, unlimited instruction, and entertainment for himself out of his daily task that others call drudgery. To him each bottle is a dear friend, each tincture or elixir is like his life-blood, each package or bottle that he sends out is like a child that he dismisses with the parting thought: Go out into the world; be of some use to someone; do good wherever you can.

You may say that such an ideal conception of a man's daily work is not borne out by the facts and stands in sharp contrast to reality. Let us not argue this case. Consider the spirit of my words,—the spirit of the nobleness of all work. Let not your work become your master—and a heartless master it is that holds you down to lifelong slavery—let your work be your friend, your teacher. There is no work so small, so menial, that does not contain some noble, elevating element.

No matter in what branch of chemistry you may engage in later years, whether you become manufacturer on a large scale or great commercial men who branch out into all parts of the world, and become millionaries, or whether you engage in teaching or pharmacy and remain poor devils as I am, the real satisfaction of your life, the real enjoyment in whatever fate may give you, will consist in the pleasure of doing your work properly and faithfully. And I trust that this one thought, adherence to the work that you find before you, faithfulness in your vocation, will remain with you. Your sphere of influence, whether it is only within your own family and a small circle of friends, or whether you may be destined to become leaders of the masses, will be good and useful if this one thought guides you in all your doings. Do your work right; live for it; love it!

Papers Presented to Local Branches

WHITE PINE BARK OF COMMERCE.*

WILLIAM MANSFIELD.

White pine bark is one of our native drugs which is profitably marketed, as it is a by-product in the preparation of pine timber. At certain times of the year there is quite a demand for the bark, as it is used in the preparation of Syrup of White Pine Compound, N. F.

In the March number of the A. Ph. A. Journal, the Committee on Unofficial Standards gave the proposed standard for white pine bark, which is as follows:

"In flat pieces of very variable size and about 1 to 3 mm. thick; outer surface varying from a pale pinkish white, when fresh, to a light, or rather deep yellowing brown, according to freshness, occasionally with small patches of the gray-brown periderm adhering, more or less fuzzy, and often showing small scattered pits, inner surface either lighter or darker than the outer, finely striate; fracture tough-fibrous, transverse section an outer yellowish and an inner whitish band. Odor slight, terebinthinate. Taste slightly mucilaginous, bitter-sweet and astringent.

"Upon incineration White Pine Bark should yield not more than 2 per cent. of Ash."

After reading the description carefully, I began to study the white pine bark of the market in order to ascertain if it would meet the requirements established. I found that it would do so in nearly every case. One or two lots, however, would not meet the requirements, as the bark was unrossed. In these lots I noticed that the inner surface showed a great many small resin masses while there were scarcely any to be seen on the inner surface of the rossed bark. This led me to examine the cross secions of the two barks. The pharmacognosist divides the bark into three zones. First, the outer bark, consisting of the corky epidermis; second, the middle bark extending from the cork to the beginning of the medullary rays, and third, the inner bark, extending from the beginning of the medullary rays inward. The rossed pine bark usually consists of the inner bark, the outer and middle bark being removed in peeling. The structure of rossed and unrossed bark must, therefore, vary greatly; as well as the nature of its cell contents, and this would seem to have a bearing on its medicinal value. Most of the secretion cavities and cells occur in the outer bark. As these are the cells which secrete the resin, it should follow that a rossed bark would be much lower in resin content. In the description, it states that the bark often shows small scattered pits. It is in these pits or cavities that the oleo-resin is secreted. In peeling the bark the resin is removed even though a portion of the cavity still remains. In the unrossed bark, the epidermis protects these cavities and as the bark dries, the

*Read before the New York Branch April 8.

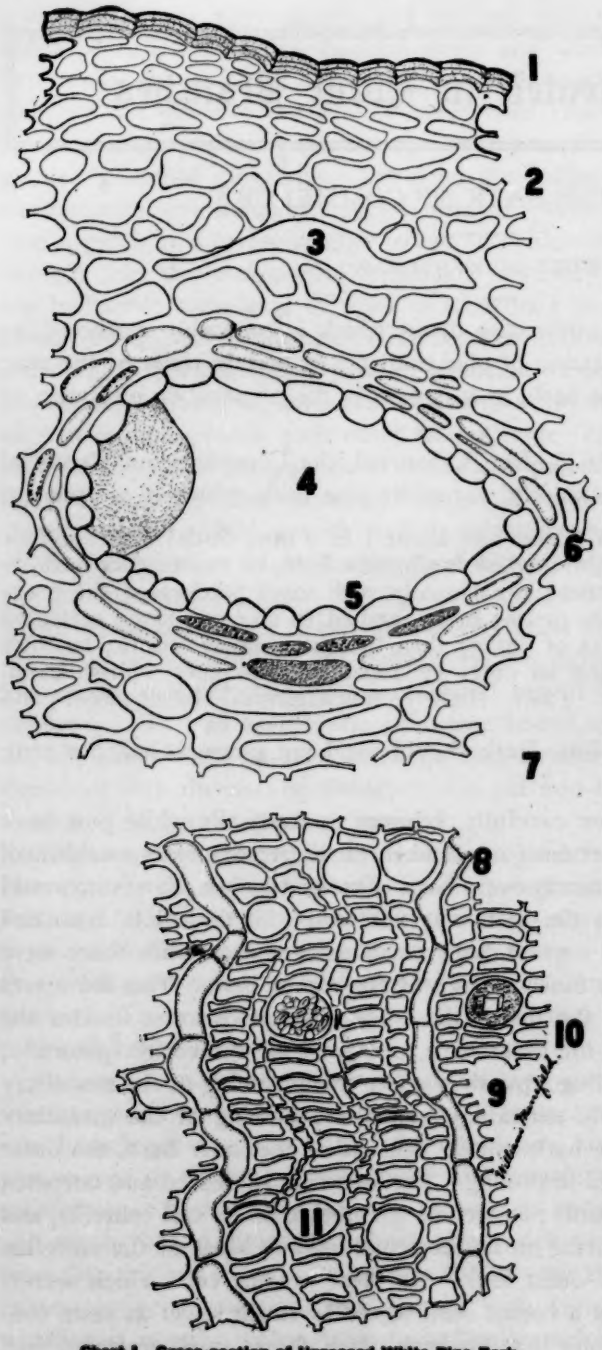

Chart I. Cross-section of Unrossed White Pine Bark.

1. Cork cells of the epidermis.
2. Parenchyma cells filled with chlorophyll.
3. Inter-cellular space.
4. Secretion cavity with resin.
5. Secretion cells.
6. One or more circles of parenchyma filled with chlorophyll.
7. Parenchyma.
8. Medullary rays.
9. } Sieve Cells.
10. }
11. Inner parenchyma cells filled with starch.

only place the evaporation of the oleo-resin can take place is at the edges or on the inner surface, where it usually occurs, owing to the ease with which it can traverse the medullary rays.

As there are no special tannin secretion cells, it would probably follow that a rossed bark would be as rich in tannin as the unrossed bark. If this is so, and it is only the tannin which is desired, in using it in the preparation of Syrup of White Pine Compound, then the rossed and unrossed bark would be equally good; the only advantage being in this case, a saving in the cost of labor, which is a very important item in making a drug commercially profitable. As the resin and tannin content of White Pine Bark is largely a chemistry problem, and just how much, if any, of the constituents enter into the final preparation, is a pharmacy problem, and by far the most important question concerns the therapeutics of Syrup of White Pine Compound: To what extent is its action due? What would be the effects on the system if the active constituents from all the drugs really enter into Syrup of White Pine Compound. The therapeutics of many of the U. S. P. and N. F. preparations offer a fertile field for study. It seem to me a line of investigation which is sadly neglected and which is absolutely necessary in order

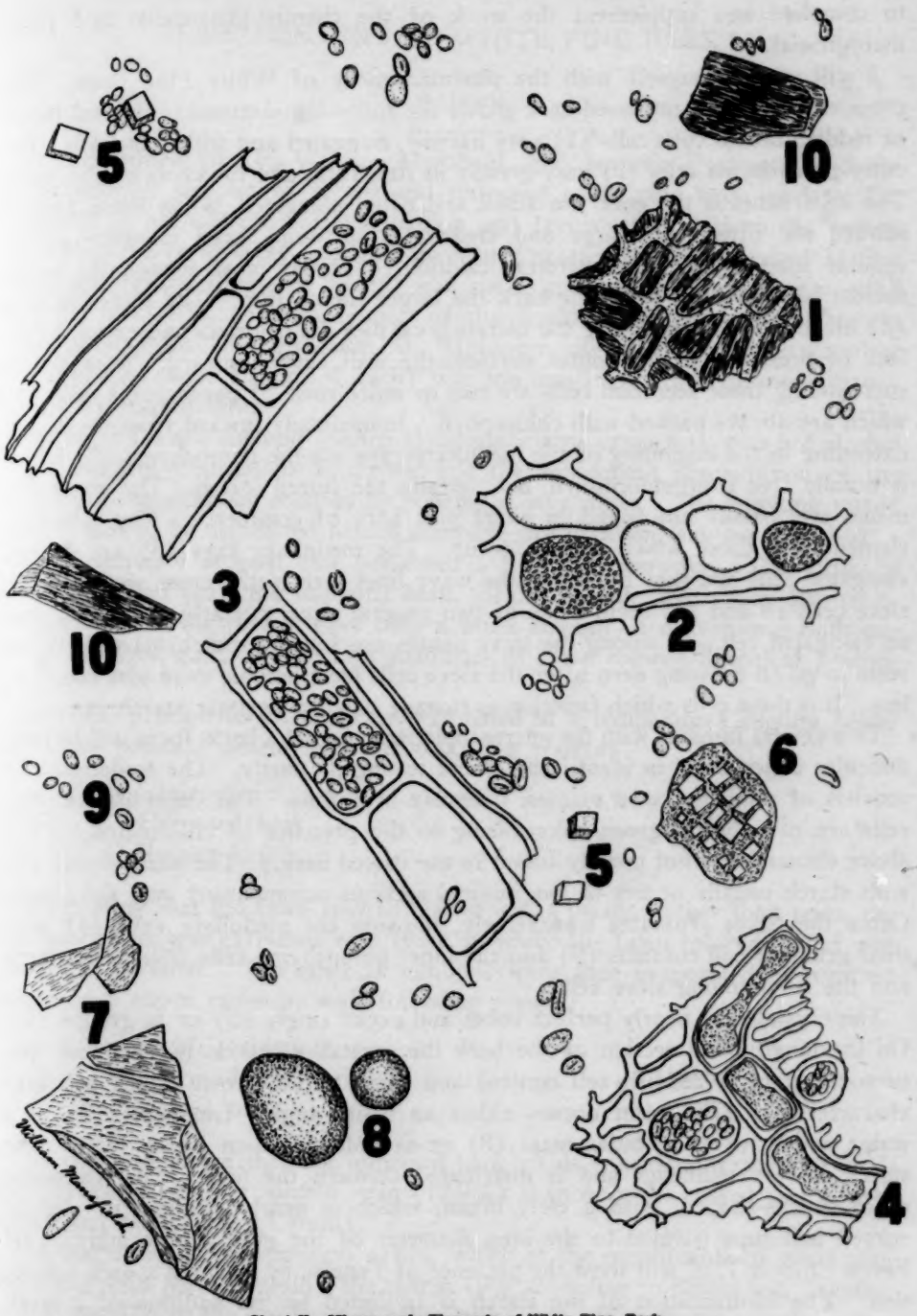

Chart II. Microscopic Elements of White Pine Bark.

1. Surface view of reddish-brown epidermis.
2. Outer transverse parenchyma filled with chlorophyll, and showing an inter-cellular space.
3. Longitudinal parenchyma filled with starch and sieve cells.
4. Transverse view of medullary rays with granular contents, inner cortical parenchyma with starch and sieve cells.
5. Cubical crystals.
6. Part of cell filled with cubical crystals.
7. Resin occurring in angled pieces in a water mount.
8. Globular masses of resin in an alcohol, glycerin and water mount.
9. Starch distributed throughout the field.
10. Reddish masses.

to complete and supplement the work of the chemist-pharmacist and pharmacognosist.

I will concern myself with the pharmacognosy of White Pine Bark. The cross section of the unrossed bark shows the following elements: Several layers of reddish-brown cork cells (1) very narrow, elongated and with thin walls. The outer parenchyma cells (2) vary greatly in size, form and thickness of the walls. The cells beneath the cork are small and often elongated, while those farther inward are often very large and frequently surround large elongated intercellular spaces (3). The secretion cavities (4) occur most abundantly in the middle bark, and the older the bark the larger the cavities. The secretion cells (5) immediately surrounding the secretion cavities are colorless and owing to the lack of pressure on their outer surface, the wall curves inward. Immediately surrounding these secretion cells are two or more rows of parenchyma cells (6) which are always packed with chlorophyll. Immediately inward from these, and extending to the beginning of the medullary rays are the parenchyma (7) which is usually free from chlorophyll, but contains the stored starch. The above elements are usually not found in white pine bark of commerce. The following elements are those which usually occur. The medullary rays (8) are greatly elongated cells and they constitute the wavy lines seen in the cross section. The sieve cells (9 and 10) seem to be of two general sizes, a nearly square cell and an elongated cell. In among the sieve tissues are found parenchyma cells which seem to go on growing even after the sieve cells have become dead and functionless. It is these cells which function as storage cells for crystals, starch, etc.

To a person familiar with the microscopic structure of a bark, there will be little difficulty experienced in identifying it and testing its purity. The epidermis (1) consists of reddish brown masses, irregular in outline. The outer parenchyma cells are of a bright green color owing to the presence of chlorophyll. (The above elements are not usually found in the rossed bark.) The parenchyma (3) with starch usually occurs in longitudinal sections accompanied with sieve cells. Often the tissue separates transversely, showing the medullary rays (4) with their granular cell contents (9) and the inner parenchyma cells filled with starch and the surrounding sieve cells.

The crystals are nearly perfect cubes and occur singly (5) or in groups (6). On the longitudinal section of the bark the crystals occur in parenchyma cells surrounded by a reddish cell content and form parallel rows which are very characteristic. The resin occurs either as white angled fragments (7) in a water mount, or as globular mass (8) or as reddish-brown pieces (10). The starch is very abundant and is distributed through the field. The diagnostic grain is lens-shaped, with a cleft hilum, which is nearly straight, or slightly curved and runs parallel to the long diameter of the grain. The addition of Ferric Chlorid T. S. will show the presence of Tannin, by forming a dark coloration. The identification of the starch is faciliated by the addition of a weak Lugols Solution, which imparts a blue coloration to the starch grain.

COLLEGE OF PHARMACY, COLUMBIA UNIVERSITY, APRIL, 1912.

RESIN CONTENT OF WHITE PINE BARK.*

H. V. ARNY.

At the request of Dr. William Mansfield, Mr. Jeannot Hostmann and the writer assayed samples of rossed and unrossed white pine bark used by Dr. Mansfield in his microscopic examination and furnished by him to the writer. We found the resin assay a more complicated matter than it appeared at first blush, since every suggested solvent was apt to extract bark constituents other than the oleo-resin, and evaporation of the liquid extract to constant weight meant possible loss of the volatile oil. Moreover, the amount of bark placed at our disposal (about 15 gm. of each) was too small to permit of more than a superficial examination.

The most feasible method seemed to be continuous extraction with hot alcohol in a Landsiedl Continuous Extractor and the subsequent precipitation of the resin from the alcoholic solution by pouring it into water. The resulting turbid mixture had to be acidulated before complete precipitation was accomplished.

The precipitate in each case presented a two-fold character. The alcoholic extract obtained from the unrossed bark, yielded considerable sticky oleo-resin, while that from the rossed, gave only a small amount of oleo-resin. Both extracts, however, gave considerable quantities of fawn colored flocculent precipitates.

The total precipitate in each case was dried at a temperature slightly below 100° C. to constant weight with the following results:

Total precipitate,

Unrossed bark	14.8%
Rossed bark	6.2%

Anticipating that the fawn colored matter was a product other than resin, the total precipitate was extracted with ether, in which the fawn colored matter was practically insoluble. The ethereal solutions were then evaporated to constant weight on a steam radiator, with following results:

Ether soluble precipitate,

Unrossed bark	12.9%
Rossed bark	4.3%

The conclusions are that the unrossed bark yields considerably more precipitate (14.8%) and ether soluble resin (12.9%) than does the rossed (6.2% precipitate and 4.3% ether sol. resin).

Pharmaceutically the question arises, which of the constituents of white pine bark—the resin (or oleo-resin), the tannin (9% according to Bastin and Trimble, A. J. P. 68, 37), or the coniferin of other authorities—is its therapeutically active principle.

As the chief use of the bark is in the form of syrup, which would naturally contain scarcely any resin or oleo-resin, the resin content of the bark seems to be of

*Read before the New York Branch, April 8, 1912.

little importance, but, as no reference as to the resin content of the bark seems easily accessable in literature, this crude effort at establishing same, may prove of some service to future investigators, who have sufficient time and material to go into the subject thoroughly.

COLLEGE OF PHARMACY, COLUMBIA UNIVERSITY, April, 1912.

EFFECTS OF SODIUM CHLORIDE, SUGAR OF MILK, CANE SUGAR, DIFFERENT KINDS OF MILK, ETC., ON THE ASSAY OF RENNIN.*

L. H. BERNEGAU AND GEORGE E. E'WE.

Out of ten lots of Rennin received and assayed by us during the past twelve months, only three came up to labeled strength in milk coagulating power, namely 1:30,000. One sample assayed less than 1:10,000; one sample assayed only 1:13,000; one 1:15,000; two 1:20,000; one 1:23,000 and one 1:28,000, or 93 per cent. of required strength.

The following method is used by us for the assay of Rennin:

Dissolve 0.1 gm. rennin in water to make 100 cc., by gentle inversion of the bottle containing the rennin and water for about half an hour. Avoid any vigorous shaking which tends to lower the milk coagulating power. (This fact was illustrated in a previous paper by L. H. Bernegau). Take some so-called pepsin bottles and place into each 75 cc. of fresh unpasteurized milk, warm to 40-43° C. and add 2½, 3, 4, 5, and 7½ cc. respectively of the rennin solution. Keep at the same temperature in a water bath and remove each bottle at the end of *exactly* 7½ minutes and note whether or not the milk is coagulated.

2½ cc. indicate a milk coagulating power of	1:30,000
3 cc. indicate a milk coagulating power of	1:25,000
4 cc. indicate a milk coagulating power of	1:18,000
5 cc. indicate a milk coagulating power of	1:15,000
7½ cc. indicate a milk coagulating power of	1:10,000

etc.

Limit of accuracy of above method.

We made many experiments to find out the difference between duplicates made with the same rennin solution and the same milk by the above method.

Experiment No. 1 showed a difference between duplicates of	4.7%
Experiment No. 2 showed a difference between duplicates of	6.0%
Experiment No. 3 showed a difference between duplicates of	4.7%
Experiment No. 4 showed a difference between duplicates of	4.6%
Experiment No. 5 showed a difference between duplicates of	5.2%
Experiment No. 6 showed a difference between duplicates of	3.1%
Average,	4.7%

Of total activity of the Rennin.

Numerous other experiments gave exact duplicates. As the limit of accuracy between duplicates is about 5 per cent. the figures given in the following tables

*Read before the Philadelphia Branch, April 2, 1812.

are within 2.5 per cent. of the exact figures in this sense. When, for example, there is an increase in activity of 26 per cent., this figure may really be 23.5 per cent.

The following experiments were carried out with two samples; No. 1 an European sample and No. 2 a domestic sample. Both were found to contain chlorides and to reduce Fehling's solution. Both came up to standard at the time they were received, but source and standard has nothing to do with our comparative experiments. We only found it interesting to experiment with samples which we knew did not come from the same source. In our tables, therefore, we will use only No. 1 and No. 2, representing the sources mentioned above.

Effect of admixture of Sodium Chloride with the Rennin.

Rennin.	Rennin: NaCl	Increase in Activity.
No. 1	1:0	0 (Dupl.)
	1:14	10% (Dupl.)
	1:7	26% (Dupl.)
	1:3	13% (Dupl.)
No. 2	1:0	0 (Dupl.)
	1:7	16% (Dupl.)
	1:3	0 (Dupl.)

Conclusions: There seems to be an optimum proportion of NaCl which will give highest milk coagulating power to rennin; above or below this optimum proportion the NaCl apparently lowers its ability to increase the activity of the rennin. This optimum proportion lies around 1:7. Rennin-sodium chloride tablets made in this proportion should be therefore most efficient in milk coagulating power. Blanks run with plain NaCl without the rennin the proportion used in the above experiments had no coagulating effect on the milk after four hours, so that the NaCl has no appreciable effect when used alone.

Effect of admixture of Milk Sugar with the Rennin.

Rennin.	Rennin: Milk Sugar.	Increase in Activity.
No. 1	1:0	0 (Dupl.)
	1:14	3 % (Dupl.)
	1:7	17 % (Dupl.)
	1:3	9 % Aver of 3 assays.
No. 2	1:0	0 (Dupl.)
	1:7	5.6% (Dupl.)
	1:3	0 (Triplicates.)

Conclusions: Milk sugar also increases the milk coagulating power of Rennin, but not to so great an extent as sodium chloride. There is also an optimum proportion of rennin to milk sugar; this proportion being, like that of sodium chloride, near 1:7.

Effect of admixture of Cane Sugar with the Rennin.

Rennin.	Rennin: Cane Sugar.	Decrease in Activity.
No. 2	1:14	16 % Aver. of Dupl.
	1:7	8.6% (Dupl.)
	1:3	4.4% (Dupl.)
	1:0	0 (Dupl.)

Conclusions: Cane sugar mixed with rennin decreases the activity of the rennin apparently in almost direct proportion (within the limits of the above experiments) to the proportion of the cane sugar in the rennin-cane sugar mixture.

Effect of Cane Sugar dissolved in the Milk.

Rennin.	% Cane Sugar in Milk.	Decrease in Activity.
No. 1	2.5%	7 %
	5 %	7 %
No. 2	2.5%	4.4%
	5 %	16 %

Conclusions: The cane sugar used in sweetening milk when making junket evidently reduces activity of the rennin employed.

Effect of different lots of Unpasteurized Milk.

Milk bo't on morning of 2-7-12.	Rennin No. 1.	Assayed 1:36,400 Average of Duplicates.	Difference 35%
Milk bo't on morning of 2-8-12.		Assayed 1:26,800 Average of Triplicates.	
Milk bo't on morning of 2-7-12.	Rennin No. 2.	Assayed 1:25,000 Duplicates.	33%
Milk bo't on morning of 2-8-12.		Assayed 1:18,800 Duplicates.	

Conclusions: Different lots of milk may exert a great influence on the assay of rennin.

Effect of treatment of Pasteurized and Unpasteurized Milk.

Milk.	Assay w/ same rennin.	Difference.
Pasteurized	1:25,000	12.5%
Unpasteurized	1:28,125	

Two other samples of rennin gave results between 10-20 per cent. higher with unpasteurized milk than with pasteurized milk. A sample of unpasteurized milk gave 4.7 per cent. (aver. of four experiments) higher after being aged 24 hours at about 5° C.

Conclusions: Unpasteurized milk gives higher results in the assay of rennin than pasteurized milk and the age of the milk also has some effect on the assay.

Rennin Tabletss Four lots of old tablets in which sodium chloride was used as a diluent, were tested recently by us to find out if an appreciable deterioration took place. Rennin certainly acts queerly on getting older,—some lots seem to die at a very young age and become inert, while others seem to grow in strength, the older they get. All four lots were tested on the same day (2-6-12) and the same milk was used. All tests were carried out at the same temperature, namely 40-43° C. The results were as follows::

No. 1. One tablet coagulated 1 qt. milk in 10 minutes. (Tested on 9-29-10; 1 tablet required 14 min.) Increase.

No. 2. One tablet coagulated 1 qt. milk in 19 minutes. (Tested on 2-14-11; 1 tablet required 12 min.) Decrease.

No. 3. One tablet coagulated 1 qt. milk in 30 minutes. (Tested on 5-2-11; 1 tablet required 11 min.) Decrease.

No. 4. One tablet coagulated 1 qt. milk in 9 minutes.

This last lot is about seven years old and as seen from this table is today the best of all of them. Unfortunately, we were unable to find the record of the first assay, seven years ago.

As rennin and its preparations are undoubtedly of interest to any pharmacist and physician, we hope that others will take up this subject and report upon it.

ANALYTIC LABORATORY OF THE H. K. MULFORD CO.

THE PHYSICIAN AND THE SCIENTIFIC PHARMACIST.*

DR. E. W. DITTRICH, M. D.
Formerly President of the Yorkville Medical Society.

Medicine, or the art of diagnosing and curing disease, has in time become a complicated science. It now comprises so many subdivisions, that various special branches have established themselves, the study of which, however complete their succession may have been, always necessitates a thorough knowledge of its fundamental developing features. Pharmacy, on the other hand, had to develop on totally different lines.

While they both, Medicine and Pharmacy, if I may say so, had the same common source, the former, as it was, developing from the latter in the course of evolution, both mutually profiting from experience and observation, pharmacy did never become an independent art owing to many facts that were detrimental to its development as such. For some of those disciplines which had become integral parts of pharmacy, began to develop independently and formed important scientific branches of their own. This was the case chiefly with Chemistry and Botany; and Pharmacy, their deserted mother science, kept only in touch with its faithless children to that extent which was necessary for its object as an auxiliary discipline to the art of healing.

But it was and will always be an important cultural factor in the successful pursuit of this art.

Appreciating these latter facts, we learn to understand the importance of pharmaceutical science, not only as an auxiliary discipline to our endeavors as physicians, but we are also forced to give it a place as a department *sui generis* in the great realm of hippocratic science. If it be true that some do not want to look at it in this light, and there are still many physicians that are only too ready to adversely criticise the pharmacist as a class, regardless of personality, then some misapprehensions and misunderstandings must surely be existing between these two professions. If this be so, they have existed entirely too long, and it will only be necessary to consider carefully some of the reasons which may be contributory in producing the poor opinion that some physicians entertain of so old and honorable a profession.

Pharmacy as a profession is and must be always carried on on purely scientific lines, but the practical part of it, as you all know, is peculiarily intermingled with commercial interests, features which tend to furnish the cause for estrangement between the two sister professions; although, in my opinion, it would not harm some gentlemen of the medical profession at all to be endowed with some of this commercial instinct.

Secondly: This estrangement, which lately has been kept up by the bugbear stories of counter prescribing and real or imputed substitution, has become

*Read before the New York Branch and the Medical Society of the County of New York, May 7, 1902.

deeper, because many physicians think now that the pharmacist in many cases assumes the rights of the physician in attempting to treat disease.

Thirdly, and this is probably the most potent reason: Pharmaceutical education in this country up to the last decade, was not up to that standard that the prescriber had a right to expect from the man that was called upon to execute his orders. All these features, taken together, have, of course, tended to foster a certain amount of distrust on the part of the physician. I could relate many cases of personal experience with alleged substitutions, which would have influenced me in this manner, if I had not stopped to investigate them thoroughly. Upon investigation, they proved to be based on nothing but malicious statements. Of late great and successful attempts have been made on the part of the scientific pharmacist to change these conditions which were so detrimental to a perfect mutual understanding, and it has been the merit of some gentlemen standing high in both professions to bring on a more effectual understanding, based on a higher scientific training as well as on mutual respect.

The curricula of the present schools of pharmacy, the requirement of a preliminary education, subject to the approval of the board of regents, and, last but not least, the necessity of having graduated from a college of pharmacy before being admitted to the board examinations, are factors that in themselves bear the guaranty of a good and thorough scientific training.

We are therefore justified in considering that pharmacist a desirable representative of his class, in whose laboratory exactitude, reliability and promptness in putting up prescriptions are the chief and prevailing mottoes and who also knows how to combine these with the necessary skill in putting his business on a paying basis. In that way he will not only serve best his own interests and those of his patients, but incidentally also those of their medical advisers.

These are chiefly the gentlemen whom I had in mind when I used the term "scientific pharmacists." We cannot expect every pharmacist to be a learned chemist in the strict meaning of the term, but what we can rightfully expect of every pharmacist, is that he should be a pharmaceutical chemist as well as a thorough connoisseur of drugs and be well versed in the very important chapter of incompatibilities, so that he be able to distinguish between incompatibilities, that were intended and those not intended. In former years I have sometimes seen my intention miscarried, when the pharmacist, or let me say here, the druggist, was unable to make this distinction and hesitated to combine the chemicals that, though they were chemically incompatible, would form the desired remedies by mutual decomposition. On one occasion, I remember, chemicals were strained out of a mixture, which, I will admit, made the same unsightly, yet were the only important remedial agents in it. I want to say here, emphatically, that these occurrences are things of the past. We do not see today any more a perfectly clear mixture when we prescribe Zinc Sulfate and Lead Acetate in distilled water, in which case, formerly, *pharmacia elegans* did get the best of the more practical and useful end of it. Here, I think, is the place to speak of a preparation which, in spite of all new and elegant substitutes, will always hold the fort as one of our most reliable indirect diuretics and mild heart stimulants, namely infusion of

digitalis. The habit of making this important preparation from the fluidextract or from a concentrated stock solution cannot be condemned in strong enough terms. If this were permissible, there would be a method for it laid out in the pharmacopœa, a book which we always should take as our standard. The slovenly and unpharmaceutical habit of preparing this infusion in the manner mentioned will not only result in a poor pharmaceutical product, but would be sufficient to put one on his guard against a dispenser who is satisfied with the exertion of so little pharmaceutical skill. It is needless to add, that only the English leaves, purchased from trustworthy and reliable firms, should be used in the preparations of this infusion. It is evident from this fact alone how important it is for medical gentlemen to deal only with those pharmacists that not only are masters in their profession, but who are also willing to undergo some little inconvenience in order to prepare prescriptions *lege artis,* and who even will make some sacrifices for the benefit of the quality of their pharmaceutical products. I personally know some pharmacists, whom I esteem very highly, that never used up a pound can of digitalis leaves entirely, but when half of the can had been used, threw away the rest. They do the same with spirit of glonoin and other articles which are liable to deteriorate with age. They assure me that, although they carry out this practice, they are able to realize a good profit on their merchandise. This practice is highly to be commended and most decidedly furnishes proof that there are gentlemen in the pharmaceutical profession who besides being thorough scientific pharmacists, would deserve to be distinguished by the honoring epithet "Pharmacien de première class."

It is therefore wrong to condemn the pharmaceutical profession because there are a few evildoers in it. It would be difficult to find any profession or business that is free from these.

Substitution, of course, will be always practiced by them, but let us leave them to the pangs of their own conscience, or, what is still better, to the ever watchful eye of our very efficient board of pharmacy. Indiscriminate counter prescribing, on the other hand, is a matter of vital importance, and it is our duty to meet the druggist who indulges in this practice by seeing that our prescriptions do not find their way into such stores.

But there are two sides to every question, and I personally am able to see the other side of this one, too. Can we blame a druggist that tries to pass some of his preparations on a customer, if he knows that the physician to whom this patient would otherwise go, were going to dispense the medicine himself, thereby depriving him (the druggist) of the legitimate means of making a livelihood? The counterprescribing druggist exposes himself to the just criticism that he assumes the doctor's rights, treating symptomatically ailments of which he does not know anything, while the dispensing physician wrongs his helping hand, the pharmacist, by intruding on the latter's rights, thereby endangering the so important community of interest that should exist between both.

In conclusion I will mention a few points that show how the physician and the scientific pharmacist can be of aid to each other, settling all questions of

common interest in an amicable manner, based on personal acquaintance and mutual respect.

The scientific pharmacist can help the physician:

1. By helping him make his prescriptions more attractive.
2. Informing him of medicines beyond the means of the patient.
3. By calling his attention to substances exploited under several names.
4. By calling his attention to new and eligible forms of remedies.
5. By showing him the Pharmacopœia is sufficient for most prescribing.

The physician can help the pharmacist:

1. By avoiding his prescribing remedies newly exploited but practically old.
2. By instructing him as to the therapeutic value of newer remedies.
3. By avoiding prescribing several forms of the same preparation.
4. By keeping as closely as possible to official remedies and by using pharmacopœal nomenclature.

THE DRUGGIST: WHAT HE HAS TO SAY TO THE PHYSICIAN.*

PETER DIAMOND.

The subject assigned to me in this night's discussions is one of interest, if not of importance; and to me, somewhat embarrassing.

From times immemorial, at their will, almost everybody had something to say to the druggist. The public, the newspapers, the legislators, agitators, reformers and anti-ites all had their turn, but at no time were we asked what we had to say. The physician often took a shot at some of us. He, largely so, looked down upon our colleagues, and in some instances, directly opposed us.

I particularly refer to the State Service Apothecary, whose advancement in rank was opposed by the physicians in the same service.

I will, more or less, admit some of the shortcomings ascribed to us; I will admit of some black sheep in the midst of the great number of pharmacists in this country, but in not any larger proportion than in any other profession.

The pharmacist must necessarily possess a fair average of intelligence or he could not pursue his vocation, and I claim for him intellectual and moral equality with those of most other professions.

And now we are asked what we druggists have to say to the physician. Is it not embarrassing?

I shall endeavor to treat the subject in an impersonal abstract way, and I beg of those who listen to me, to take it in a similar light.

Personally, I do not claim to have come here with absolutely clean hands. I am as much a victim of surrounding circumstances as others of my profession, but, with many others, I wish for and am willing to help make both mine and

*Read before the New York Branch and the Medical Society of the County of New York, May 7, 1902.

your professions as ethical as possible and establish relations between the two professions as friendly as they should be.

The pharmacist is, or should be, the compounder and dispenser of medicines. If he is not entirely that today, it is due to the environment, circumstances, and a social system far beyond his control.

For years he has been, and still is, striving to overcome, or at least check that which is constantly dragging him from his vocation into a vortex of side lines, that make his once drug shop look like anything but the respect-inspiring, clean, orderly pharmacy of Germany, Russia, or many other European countries.

His attention is distracted from his real work and directed to anything in the commercial line that may assist him in holding his own against competitors, whose sole aim is the increase in dividends upon their investment, but who take no pride, have no interest in the pharmaceutical profession itself.

Many of his shortcomings, we cannot but admit, are due to the circumstances, and while striving to eliminate them, we look to the physician for assistance—and assist he can, in many respects.

DISPENSING AND COUNTER-PRESCRIBING.

The question of dispensing by the physician and counter-prescribing by the druggist is of such vast importance to both, it is so complicated, it is so hard to draw the line as to where the right ends and the wrong begins, that the only way to solve it is to entirely discard advice in the drug store; dispensing or furnishing of medicines in the physician's office.

True, the one has a legal right to diagnose, prescribe, dispense and issue a death certificate, while the other's legal status is confined to compounding or dispensing only; nevertheless, from an ethical and economic standpoint, we claim, and many physicians concede, that dispensing by the practitioner is an infringement upon our rights. I am, of course, excluding the country doctor, where conditions make the emergency case imperative.

I am fain to believe, however, that on this score we are almost agreed, and as we, throughout press and associations, are constantly agitating the discontinuance of counter-prescribing, so we expect you to call upon the members of your profession to discontinue dispensing.

NOSTRUMS.

So much has been said on the subject of prescribing patent or proprietary articles, or so-called specialties, that nothing new can probably be added to the arguments advanced. It is, however, so within the province of the subject assigned to me, that it will seem a flagrant omission should I ignore it entirely.

It is, of course, natural to expect that the physician, having diagnosed a case, will prescribe. It is also natural to assume that in prescribing, he will put down the ingredients, carefully figure out the doses of all potent drugs, such as strychnine, codeine, morphine, digitalis, and what else, and having impressed the patient with proper directions and perhaps—having warned him of the careless or greedy druggist, may rightly feel that he has honestly discharged an obligation to the patient, to his profession and to himself. But is it so in all cases? Is it not

true that the physician finds it often more convenient and less troublesome to jot down: "Syr. Codeia" or "Pil. Pasbi" or "New-Nervi York"?

What if he does not know the ingredients or the doses in the preparation used? The detail man has taken care to impress him with the usefulness and harmlessness of them.

Many of those using such nostrums have only a vague idea of its composition. How many physicians can tell the formula of H. V. C. or even of such preparations as A. K.? So we not often see, at times hazardously, unknowingly, perhaps, prescribed in one recipe A. K. Phenalgin, and Phenacitin, not dreaming that they all contain, principally, the same chemical?

How many are even aware of the exact quantities of a narcotic in such preparations as Glyco-Heroin, Bromidia, Papine, etc.?

You may imagine the predicament of a certain physician who prescribed two ounces of Syr. Coccilana Comp. for an infant about a year old, to be given in doses of one teaspoonful every two hours, when I called him up and informed him that the perscribed syrup contained one-third of a grain of Heroin Hydrochl. to the ounce. In other words, that he ordered one-twenty-fourth of a grain of Heroin to be given to the infant every two hours, and the physician I refer to is usually rather painstaking, intelligent; but the constant grind of the detail men have made him depart from his usual path.

The argument is often advanced by the physician that certain preparations are used by them because of their pleasant taste; they are good to look at, and palatable, many say. Is an argument of that kind a sufficient excuse for blindly prescribing preparations, the composition of which is almost unknown to them? If they were only to take the trouble to study the preparations of the U. S. P. and N. F., they would find numberless preparations just as palatable and just as good to look at, with the formula given in full detail.

The U. S. P. and N. F. preparations are not uniform, many physicians argue. They differ somewhat in color and taste when put up by different druggists. That may be so, but do not the fluidextracts put up by different firms look different and taste different? Are not the elixirs, syrups, liquors put up by the various pharmaceutical houses different in taste and color? And still, how often does the physician specify one or another pharmaceutical house?

The physician forgets that it is an almost physical impossibility for any retail druggist, or for that matter, wholesale druggist, to carry in stock fluidextracts, pills, tablets, elixirs, syrups, etc., of all the leading pharmaceutical houses. He often tempts the druggist to commit a technical wrong—if wrong it be—by specifying the pill of a certain pharmaceutical house.

Is it not more proper—is it not more ethical—is it not more decent to specify the pill the physician desires, permitting the druggist to either make same or dispense that of any reliable house?

Another reason for prescribing specialties or proprietary articles is that many physicians own, by purchase or by gift, stock in chemical companies, which companies, in most instances, are of questionable repute. I charge so, knowingly, for I can convince any fair-minded man, that if not directly unreliable in their

statements, the companies' sole aim is to manufacture as cheaply as possible and dispose of their products as dearly as possible.

My time is limited or I could continue on this subject for a long time. There are other things I desire to mention.

ILLEGIBLE PRESCRIPTIONS.

Has the average physician ever considered the importance of writing prescriptions as legible as possible? Does he realize the errors a quickly hap-hazard, quickly written down recipe may lead to? The difficulties and predicaments it may put the dispenser to?

One cannot, at all times, communicate with the physician, and either you keep the patient under one pretext or another, waiting, or—decipher the best you can.

It is a habit many physicians have acquired that should be stamped out in its inception; that is, at college. Medical students should be impressed with the importance of properly writing prescriptions as well as with the importance of proper diagnosis.

I cannot, in my talk to the physician, before winding up, but say a few words of a habit, inaugurated, it is true, by the druggist, but acquiesced in, and at times encouraged by the physician—the habit of supplying the practitioner with prescription blanks, advertising the druggist furnishing the same, and the habit of sending to the physician useful reminders of the sender.

The use of blanks bearing the name of any druggist is a presumption that the physician favors this one in particular, at least to the laity it seems so.

There is as much wrong in that as there is in sending patients to one particular physician to the exclusion of others.

One would not dream of carrying a druggists' ad on his card—why then on his blanks?

This custom of itself may seem quite harmless, but like all such habits, grows in extravagance until the tokens assume considerable value, becoming a burden to the giver, and to the recipient—well, he cannot ignore it.

While I blame the druggist for primarily creating the habit, still we must remember that production is regulated by the demand or market.

Gentlemen of the Medical Profession, my talk to the physician is for the purpose of arriving at some means of eradicating what we consider improper, unethical, or as being in the path of our friendly relations. You who are striving to be as ethical as possible, you whom this talk does not reach at all—of you we expect and ask the assistance necessary to reach those who take no interest in either medical or pharmaceutical movements; those who remain in their offices or in their drug stores; those who have never lifted a hand to better the medical profession or pharmacy.

And the only way to do the work and to do it properly is that you, gentlemen, should take an active hand in the matter, and through publicity in the medical press and in the pharmaceutical press, awaken those who, while asleep, continually complain.

I wish to reiterate again that I am not preaching. That I merely express an

honest desire to better myself and help my colleagues to better themselves and that I call upon you to do likewise in your profession.

I cannot pass over in silence the fact that many physicians, today, ignore the individual corner drug store—that many are dazzled by the brilliant displays of the corporation stores, either not knowing or not desiring to know, that it is mainly these gigantic combinations that reduce the individual druggist to the necessity of forgetting his professional ethics in his fight for existence.

I regret to say that many physicians today direct their patients to the corporation stores, in whose windows you may see, alongside with a biological display, several baskets of fresh-laid eggs at the rate of twenty-three for a quarter.

THE ABILITIES OF THE PHARMACIST.*

G. C. DIEKMAN, PHARM. D.

In speaking of the abilities of the Pharmacist, I will refer only to such of his or her abilities (for we have quite a number of women who have taken up the study and practice of Pharmacy), as are of particular interest to the physician who is critical as to the manner in which the prescriptions he writes are compounded.

In a large city like ours it is quite natural that there should be some persons engaged in the practice of pharmacy who do not meet the expectations of the physician in this regard. In most cases this may be attributed to carelessness, but I dare say that in some cases a lack of technical knowledge and skill is the source of the trouble.

It must be remembered that it is only in recent years that the state has interested itself in the matter of the practice of pharmacy, as far as the preliminary education of the candidate and his compulsory attendance upon the courses of study of a pharmacy school is concerned.

Prior to the year of 1898, a license to practice pharmacy in the City of New York was obtainable in one of a number of ways, as follows:

(a) Registration upon the Diploma of a Medical school.
(b) Registration upon the Diploma of a Pharmacy school.
(c) Registration upon a License to practice Pharmacy, issued by the Board of Pharmacy of another state.
(d) Registration obtained by passing a satsfactory examination before any of the Boards of Pharmacy of this state, of which there were four, namely, the New York City Board of Pharmacy, the Kings County Board of Pharmacy, the Erie County Board of Pharmacy, the State Board of Pharmacy.

In the first three instances the registration was obtainable without the formality of passing an examination. All applicants for registration were required to be at least 21 years old, and excepting in the first instance were required to furnish evidence of having had at least four years' experience in a place where drugs and medicines were sold and where physicians' prsecriptions were compounded.

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It will be seen that neither the preliminary education of the applicant nor attendance and graduation from the course of studies of a College of Pharmacy were factors.

After January 1, 1898, and prior to January 1, 1905, all applicants to practice pharmacy were required to pass an examination before the Board of Pharmacy, but the applicant was still not required to furnish evidence of preliminary education, nor was graduation from a reputable college of pharmacy a prerequisite to examination.

Owing to the comparative ease with which a license to practice pharmacy was obtainable, many persons unfitted by habit or lack of preliminary education were tempted to take up the practice of pharmacy.

Many physicians obtained a license to practice pharmacy upon their medical diplomas, prior to January 1, 1898. It is not claimed that there were unfitted by lack of preliminary education, but it is claimed that they did not possess the necessary practical experience to successfully practice pharmacy.

The educated pharmacist, at an early stage, recognized the dangers arising from these lax conditions, not only to himself, but to the physician and public as well, and set about to provide a proper remedy. This remedy was found in the enactment of legislation requiring that all persons desiring to practice pharmacy must show evidence of possessing the necessary preliminary education, and must have been graduated from the course of studies of a recognized school of pharmacy.

For the enactment of these laws, regulating the practice of pharmacy in these two important particulars, the pharmacist is solely responsible, and he should be given the entire credit. It was through the efforts of individuals, supplemented by the State Pharmaceutical Association, that these laws, safeguarding the practice of pharmacy for the protection of the public, were enacted.

The requirements which the state now imposes upon all such as desire to enter upon the study and practice of pharmacy are defined in Section 233 of the Public Health Law, and briefly are as follows:

Satisfactory evidence verified by oath shall be required by the Regents of all candidates for admission to the examinations.

Pharmacist—They shall admit to the examination for pharmacist any candidate that pays a fee of $10, and,

1. Is more than 21 years of age.

2. Is of good moral character.

3. Had prior to beginning the first year of study in the school fifteen counts or the equivalent.

4. Has studied pharmacology as outlined in the syllabus not less than two years in a school.

5. Has either received the diploma of graduate in pharmacy or equivalent degree from a school, or a license to practice pharmacology in some foreign country registered as meeting the minimum requirements of this article. The diploma of graduate in pharmacy or equivalent degree shall not be conferred on any one that did not file with the school at marticulation the pharmacy student certificate required above.

6. Has had four years' experience in a registered pharmacy, one year of which experience within five years of the date of application must have been in a pharmacy of the United States under the personal supervision of a pharmacist.

The requirement of fifteen counts before admission is not very high, but it has had the effect of bringing a much better class of men to the pharmacy schools, and will no doubt, just as soon as conditions warrant it, be materially raised.

All colleges of pharmacy in this state are now operating under supervision of the State Education Department, and each is required to give a course of study, which in duration and quality conforms with that prescribed in the Pharmaceutical Syllabus.

The State Education Department, before a college can become registered as meeting the minimum requirements, requires the following:

(a) The value of apparatus and equipment shall not be less than $5,000.
(b) Not less than three professors shall be employed regularly in giving instruction.
(c) Practical work shall be required in not less than three laboratory courses, including chemistry, pharmacy and materia medica.
(d) A two-year course of instruction shall be afforded.
(e) A minimum of recitation and laboratory hours shall be required of pharmacy schools as follows:

Session.	Recitation.	Laboratory.	Total.
1906-7	320	430	750
1907-8	385	515	900
1908-9	430	570	7000
1909-10	500	600	1100

It will thus be seen that 600 out of every 1100 hours of instruction are devoted to laboratory work. While the above represents the requirements at present imposed upon the registered schools by the State Education Department, the schools of this state exceed these requirements in every instance.

Manufacturing Pharmacy, which deals with the manufacture of galenical preparations, and Dispensing Pharmacy, which deals with the preparation and compounding of medicines, formulas and prescriptions, are important subjects of instruction. Analytical Chemistry, in so far as it relates to the recognition and detection of substances and establishes the presence of impurities or adulterations, and Microscopical and Commercial Pharmacy, dealing with the recognition of drugs and drug powders and their adulterants, are other important laboratory subjects.

Students are not permitted to graduate unless they have shown marked proficiency in their work, more especially so in the laboratory subjects.

In the work of the Dispensing Laboratory the student is enjoined to be accurate above all, not to use *about* such a quantity, but to use at all times *exact* quantities. Furthermore, he is impressed with the absolute necessity to at all times dispense only such articles as are wanted by the physician. The pharmacist has no right to delegate unto himself the liberty to deviate from the terms of the prescription or order, excepting with the express consent of the physician. Every pharmacist worthy of the name will uphold and subscribe to this principle and will assist the physician in seeing to it that it is strictly adhered to.

Violations of this principle should be brought to the attention of the proper authorities and redress will follow promptly. The honest pharmacist, and he constitutes by far the largest number of the profession, suffers quite as much from

the practice of substitution as do the physician and the public, and is just as anxious and desirous to have the evil eradicated.

In the subject of Manufacturing Pharmacy, the student is taught to properly prepare the different classes of galenical preparations, such as Tinctures, Fluid-extracts, Elixirs, Emulsions, Pills (with their coating), Suppositories, vaginal, rectal and urethral, Ampulles, Tablet Titurates, Compressed Tablets, Ointments, Cerates, Liniments, Cachets, Wafers, etc.

The up-to-date pharmacist is prepared to furnish any pharmacopœial or National Formulary preparation of standard strength and purity, or to furnish and prepare any other formula which the physician may desire to have made. Contrary to the idea held by many, he is able to coat pills with Keratin or Gelatin, or to coat them with Gold or Silver Leaf or Tolu, or any other coating required by the physician. The many advantages possessed by a freshly made and freshly coated pill mass are obvious.

The preparations on exhibition here this evening are a fair sample of what can be done in the line of manufacturing pharmacy by the average pharmacist of today. The quality of these exhibits is by no means the exception, but rather the rule.

I would not have it understood that only the graduates of the present day possess the ability to properly compound and dispense. Many of my brethren in pharmacy who do not possess all the advantages of a preliminary education, are among our best and most accurate workers, they having received a most practical training in the different establishments where apprenticed and employed. Then again we have many of our pharmacists who have received a most excellent education abroad in some of the best Universities.

Then again, it must be remembered that many persons now practicing pharmacy successfully, judged from a professional and scientific standpoint, are graduates of colleges of pharmacy, before such time when attendance upon the studies of a college of pharmacy became compulsory. The list of graduates of the schools of pharmacy of this state will bear evidence of the fact that very many young men did not avail themselves of the "short cut" via the Board of Pharmacy, but attended a school of pharmacy and graduated therefrom.

In order to test the ability of the graduate in Pharmacy and to make certain that the college has not conferred the degree of Ph. G., or other degree, upon anyone unworthy, the state requires that before one may legally enter upon the practice of pharmacy in this state, he or she must pass the examinations prescribed by the State Education Department, through its State Board of Pharmacy.

In these examinations the practical ability of the candidate is thoroughly tested, as will be evidenced by the following rule of the State Board of Pharmacy, relating to practical work:

PRACTICAL EXAMINATIONS.

Rule 22 states as follows:
These shall consist of the manufacture of:
Two galenicals.
The dispensing of three prescriptions, and
The testing of two substances for identity or impurity.
In the practical examination ten samples shall be submitted for identity, which

shall be of pharmacopœial or National Formulary origin, five of which shall be crude drugs, and five shall be chemicals or galenicals.

In connection with the matter of these practical examinations, I beg to be permitted to bring before you examples of some of the exercises actually given, as follows:

Manufacturing—

Basham's Mixture	250 cc.
Emulsion of Asafoetida	100 cc.
Unguentum Sulphuris	15 gm.
Donovon's Solution	25 cc.
Pills of Aloes and Mastic	No. xx
Chalk Mixture	25 cc.
Ointment of Iodine	10 gm.
Triplex Pills	No. x
Zinc Paste (Lassar)	25 gm.
Tincture of Nux Vomica	50 cc.

Dispensing—

℞

Sodium Salicylate	8.0
Sodium Bicarbonate	5.8
Glycerin	20.0
Distilled Water, q. s.	60.0

M. s. a.

℞

Phenyl Salicylate	0.3
Castor Oil	0.3

Misce,
ft. caps. d. t. d. No. viii.

℞

Tannic Acid	1.0
Powdered Opium	0.2
Cacao Butter, q. s.	

Misce,
ft. suppos. No. vi.

℞

Terpin Hydrate	6.0
Glycerin,	
Syrup of Wild Cherry, āā	20.0
Powdered Acacia, q. s.	
Distilled Water, ad.	90.0

Misce,
ft. emulsio.

℞

Silver Nitrate	gr. 1/10
Kaolin,	
Petrolatum, āā q. s.	

Misce,
ft. pil. No. xii.

℞

Ichthyol	2.0
Cacao Butter, q. s.	

Misce,
ft. globuli No. vi.

℞

Zinc Sulphate,
Sulphurated Potash, āā 4.0
Rose Water, q. s. ad.
Misce,
ft. lotio.

℞

Red Iodide of Mercury..... 0.01
Sugar of Milk, q. s.
Misce,
ft. d. t. d. tabellae No. 1.

℞

Cod Liver Oil..... 25.0
Acacia,
Sugar, āā q. s.
Distilled Water, q. s. ad. 0.50
Misce,
ft. s. a.

℞

Menthol ..... gr. v
Camphor ..... gr. x
Liquid Petrolatum, ad. ..... oz. ii
Misce,
Sig. Use as a spray.

℞

Yellow Oxide of Mercury..... 0.8
Wool fat,
White Petrolatum, āā 4.0
Misce,
ft. unguentum.

℞

Terpin Hydrate ..... oz. ss
Glycerin ..... oz. iss
Elixir of Orange, q. s. ad. ..... oz. iv
Sig.

℞

Ammoniac 4.0
Paregoric 8.0
Distilled Water 100.0
Misce,
ft. emulsio.

℞

Tannate of Mercury 0.1
Misce,
ft. tabellae. No. xxiv.
Sig. Capiat unam pro re nata.

(Translate into English and write upon label.)

℞

Extract of Belladonna..... 0.02
Thymol Iodide 0.06
Cacao Butter, q. s.
Misce,
ft. suppos. d. t. d. No. vi.
Sig. Unum omni tertia hora.

(Translate into English and write upon label.)

Test the following:

(a) Potassium Iodide for Iodate.
(b) Potassium Citrate for Tartrate.

(a) Bismuth Subnitrate for presence of Carbonate and insoluble foreign salts.
(b) Potassium Bromide for Bromate.

(a) Tannic Acid for Dextrose and Resins.
(b) Menthol for presence of Thymol.

(a) Borax for presence of Carbonate or Bicarbonate.
(b) Cream of Tartar for presence of Starch or other insoluble matter.

The results of the practical examinations, that is, the work turned out by the candidates, is very gratifying and proves that they are highly proficient in this branch of their study.

If time permitted I should like to dwell in more detail upon other factors tending to prove the ability of the pharmacist, such as a more detailed account of the college courses and a more thorough analysis of the State Board of Pharmacy examinations, and I trust that in the discussion which is to follow, such points as I may have omitted, or others which I may have treated lightly, will receive attention

In closing, I say without hesitation that the up-to-date pharmacist possesses a rare degree of ability, for which he is not commonly given credit, except by the few, and I trust that the practicing physician will more often give these pharmacists an opportunity to display and prove their abilities.

SOME OF THE GOOD THINGS OF THE NATIONAL FORMULARY.*

LOUIS SAALBACH, PHARM. D.

The N. F. as a handbook is not properly appreciated by the average pharmacist. It is full of good things from a pharmaceutical, therapeutical and commercial standpoint. Within its pages may be found formulas which might pave the way for future fortunes, if one was inclined to devote his life to the chase of the elusive dollar,—formulas which will produce preparations whose prototypes now grace the shelves of the average drugstore in endless variety, with fanciful trade names and literature descanting upon the virtues, both real and imaginary, which the component parts of the mixture are supposed to possess. And why should it be necessary to pay one's money into the already overloaded coffers of the pharmaceutical houses? Is it not better pharmacy to produce a preparation which we know has the substances, or the active constituents which are implied by the name under which it is known? In every instance such preparations may

*Read before the Pittsburgh Branch.

be produced by even an average pharmacist at a price considerably lower than that of those whose merits are made known to the physician by that bugbear of pharmacy, the "detail man." Do a little detailing yourselves, and you will be surprised to see how rapidly a physician will be converted to ethical preparations.

To name all of the preparations of the N. F. which might be designated as good things would require the majority of the titles in the book. It is not reasonable to suppose that all preparations can be made to go in every locality. Some stores dispense large quantities of emulsions, elixirs, etc., while in other places their sale is in very limited quantities only; but in every instance some formula or formulas may be found which would prove veritable gold mines if properly exploited.

The writer knows of one store in which a single quart of Alkaline Antiseptic N. F. was prepared and shown to a number of physicians who had been in the habit of prescribing an overpriced proprietary article having essentially the same composition, and in every instance they have been converted to the use of the ethical preparation, the one of known composition which produced the results which one might expect from such a solution of antiseptic agents. The pharmacist here referred to now makes this preparation several gallons at a time, sells it at a price much lower than he would be compelled to ask for the overpriced proprietary, the physician is satisfied, as is also the patient, and a larger profit is found in the cash register of the pharmacist.

The detail man, when he sees a physician, usually dwells long on the beauty of his specialty. No doubt a "thing of beauty is a joy forever," and when you begin as a pharmacist to practise your real profession, instead of devoting most of your attention to selling patent medicines at cut prices, see that your preparation will have a beauty that will appeal to both physician and laity. This, of course, requires a knowledge of the technique of pharmacy; filtration, and clarification by proper means, for without beauty as one of the attributes of your preparations you cannot hope to compete successfully with those who have made the study of beauty an art in itself.

The "Petrox line" of the N. F. forms a class of preparations which can be made into profitable specialties. Petrolatum Saponatum Liquidum, as the base of these preparations is designated, is a clear pale yellow transparent solution of liquid petrolatum in ammonia soap (oleo acid and spirit of ammonia). It is a solvent for iodine, methyl salicylate, ichthyol, guaiacol and many other substances. It has the peculiar property of forming a permanent emulsion with water, a fact which is made use of in the manufacture of a well known corn cure. In the proprietary field we find its prototype under the title "Vasogen," which is the name under which the article made on the other side of the Atlantic is marketed, and under various other titles when produced by the American manufacturers.

The imported article with most of its medications costs about thirty (30) cents an ounce, while the American manufacturers content themselves with a price of about eleven (11) cents an ounce. Those containing various proportions of iodine are the most expensive to produce; and the one containing 10 per cent. of iodine can be made by the pharmacist who buys his goods in ordinary jobbing quantities, for about sixty (60) cents a pound, which is less than four (4) cents an ounce.

Other medications and those containing iodine in lesser quantities can be made correspondingly cheaper. Quite a saving, and a saving which is accomplished at the expense of a little pharmaceutical skill! And it will not take long to convince the physician of the wisdom of prescribing the N. F. preparation on account of the monetary saving to his patient, if for no other reason.

The elixirs are too numerous to mention. Suffice it to say that not less than 50 per cent. of a saving is a low estimate on those elixirs which are used to a comparatively large extent. Among these may be mentioned Elixir of Terpin Hydrate and Codeine, and Elixir Terpin Hydrate with Heroin. Even at the present high price of the alkaloids which enter into these preparations they can be made for about fifty (50) cents a pint for the former and a very little more for the latter. While to buy them at the present time under the label of any house that may be considered reliable will cost over a dollar a pint.

The Elixir of Glycerphosphates of Lime and Soda costs about eighty (80 cents a pint to buy and less than half that to make.

Oil of Mullein is a commercial article sold at a ridiculously high price. The N. F. does not mention this preparation specifically, but it does give a general formula for infused oils. Oil of mullein costs to buy forty-five (45) cents an ounce; it can be produced for about that price per pound.

Among the syrups may be mentioned Compound Syrup of White Pine. This can usually be purchased cheaper than it can be made; but such articles when compared with those of your own manufacture usually suffer by such comparison. The cheaper varieties are frequently made with molasses and readily ferment. It might be well to mention in passing, that when you compare cost of manufacture, with published quotations, one must always choose the highest priced one as that is the one most liable to be up to standard. Low priced pharmaceuticals, especially when priced lower than the cost at which they can be produced by the pharmacist, should always be looked upon with suspicion, as you never get more than you pay for; frequently much less.

The Syrup of Hypophosphite of Soda of a well-known make, crystal in its transparency, costs eighty (80) cents a pint; it can be made by the pharmacist for about fifteen (15) cents a pint plus a little time and care in the making. He can produce it just as transparent, just as colorless, if he makes his syrup by cold percolation, using pure sugar or rock candy and distilled water.

Milk of Magnesia when purchased under its trade name, costs about thirty-five (35) cents for a ten-ounce bottle, or when purchased in three-pine bottles, about forty-two (42) cents a pint, while it can be made for about three (3) cents a pint. How is that for a money maker?

Among the dry substances may be mentioned Caffeine and Sodium Benzoate and Caffeine and Sodium Salicylate. Contrary to popular opinion these are not definite chemical substances, but are mixtures of caffein with the respective sodium salts, intimately mixed and made into a paste with alcohol, then dried and pulverized. Caffeine is not very soluble in water, but is soluble in solutions of various substances. These compounds (?) are soluble. They are quoted at forty (40) and forty-five (45) cents an ounce. If the pharmacist buys his chemicals only in ounce lots, these can be made for twenty-two (22) and twenty-three (23) cents

an ounce, and if your chemicals are purchased by the pound they can be produced for less than fifteen (15) cents an ounce.

The topic is not exhausted, the most popular ones have not even been mentioned, but a sufficient number have probably been mentioned to prove that the N. F. is a vast storehouse of "Good Things."

WHY SOME DRUGGISTS DON'T MAKE MORE MONEY.*

HARRY B. MASON,
Editor of the *Bulletin of Pharmacy.*

In an address which I have recently prepared at the request of another association, but which has not yet been delivered. I have shown in detail how strikingly at variance druggists are in the incomes derived from their stores. I have presented the actual facts about twenty-five druggists who are scattered in different sections, and who therefore represent the average conditions as they are found over the country. The percentage expense of these men run from 18 to 35! Their percentage of gross profit runs from 31 to 51! Often one man realizes a total income as large as another whose volume of business is nearly twice as great!

Now why do these discrepancies exist? Why does it cost some men so much more than it does others to do business? Why do some men realize a profit so much less than others? Why does one druggist make so much more than his neighbor on a business of exactly the same size?

The answer to all these questions is simple. Locality and environment have something to do with the problem, it is true, but in the last analysis, and in the great majority of instances, the fundamental reason is that some druggists are poor business men—that's all. They don't study the game. They haven't mastered the rules. They aren't skillful in playing their cards, and, worse yet, they make one blunder after another without ever knowing it.

Now, what are some of these blunders?

1. *They don't keep business accounts.* This is the day of science in commercial operations, when every large business house, in whatever line of trade, is making a close study of business economics, and yet many druggists are nevertheless following the good old-fashioned method, or lack of method, of spending what accumulates in the bank account and fancying that it represents net profits. Hundreds of such men have discovered when it was too late that they were eating up their principal without knowing it, and that accumulated dead stock, decreasing inventories, and bad book accounts had cut into their imagined profits so far as almost to destroy them entirely. The sheriff has had to come along and close them up before they tumble to the situation. A druggist who does not keep

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* Address, delivered by invitation, before the Chicago Branch of the American Pharmaceutical Association, May 21, 1912.

careful business records is not in position to know anything at all about the amount of money he is actually making. He is simply asleep at the switch.

2. *They don't take inventories.* The druggist who does keep business records, but who fails to supplement them with annual inventories, isn't much better off. In Philadelphia not long ago two brothers bought a store which had previously enjoyed a very good trade, and which was pretty well stocked. The first year the new owners thought they were making all kinds of money. They increased their living expenses and plumed themselves with the thought that they had finally landed on their feet. Over a year went by, perhaps indeed two years, before it began to dawn on them that they had been gradually decreasing the stock in the store, and that much of the money which they thought they had been making as profit was literally taken out of their capital. An inventory would have prevented them from making this mistake.

A druggist in Missouri, who submitted his business statement to us for two or three years in succession, was finally induced to begin invoicing his stock annually. What was the result? He discovered the very first year that his assets increased to the extent of $1,600. If he had taken no inventory, if he had based his calculations upon purchases and sales alone, his figures would have been grossly inaccurate. To be sure this particular druggist would have erred on the safe side, but the very next year the situation might have been approximately reversed.

More striking yet was the case of an Arizona drug firm, from which we received a statement indicating net profits during the year of $1,256.31. The inventory had been taken, but it had not been figured up and compared with that of the year before. When we received the inventory figures for both years, and carefully went over the entire statement again, we found that this Arizona firm, instead of making a net profit of $1,256.31 during the year, had actually lost $716.60!

Instances like these might be multiplied—but what's the use! As I have said on other occasions, I have been brought in contact with numerous cases where the inventory figures have disclosed differences in the value of the stock to the extent of anywhere from $200 to $2,000, according to the size of the store and the nature of the circumstances. The stock in any store is constantly shifting; the prices are forever fluctuating; the fixtures, and particularly the soda fountain and its appurtenances, are always undergoing depreciation, and the druggist who is not aware of the exact nature and extent of these changes is not in position to know where he stands. He may fancy his percentage of gross profit to be 40, when in fact it is only 30, and he may consequently be losing money on many transactions which he fondly believes are yielding him good returns.

3. *They don't know how to figure profits.* There are many druggists who do keep business records, and also take inventories, but who blunder strangely in the calculation of profits. A very common mistake is to figure the precentage expense of doing business on the volume of sales, which is right, and then to figure the profit, not in the same way on the selling price, but *on the cost.* It is true that ordinarily, in every day language, profit estimates are based on the cost price.

This is the method we are taught in school, and it is the method most frequently met with in the advertising announcements of manufactures. A manufacturer, for instance, who sells you an article at $1.00, the retail price of which is $1.75, will tell you that you are making 75 per cent. profit. This is legitimate and right, but the wise merchant must thoroughly realize under such circumstances that *he is considering a profit based solely on cost,* and when he comes to apply the figures in his own business, *he must understand the necessity of converting them to the other system and basing them on the selling price.*

Expenses are nearly always estimated from sales—this is almost a universal custom. If, therefore, the profits are to be compared with the expenses, they must both be figured by the same method. Suppose you pay $1.00 for a certain product and you desire to make 35 per cent. on it gross. It costs you 25 per cent., we may assume, to do business. You want to make a 10 per cent. net profit beyond that for yourself. Very well, then, what should the selling price be on this article which costs you $1.00, and on which you want to make a gross profit of 35 per cent.? If you make the common mistake of basing this 35 per cent. on the *cost* price you will sell the article for $1.35, but if you do let us see how you will come out. It will cost you, as we have already assumed, 25 per cent. of the *selling* price to handle the article. Now 25 per cent. of $1.35, the price you place on the product, is 34.75 cents, so that you are selling for $1.35 an article which cost you $1.34¾, and while you flatter yourself that you are making a net profit of 10 per cent., you are practically breaking even on the transaction!

There are hundreds of merchants—perhaps thousands of them—who are figuring their profits in this erroneous manner. Some months ago the Burroughs Adding Machine Company published an advertisement in one of the national magazines requesting answers to the following question: "A certain article costs $1.00 wholesale. What will it have to be sold for to allow a net profit of 10 per cent., after allowing 22 per cent. for the cost of doing business?" Something like 1,000 replies were received, of which 750 were wrong! The answers ranged all the way from $1.10 to $1.60. The majority gave the selling price as $1.32, notwithstanding the fact that an explanation was printed at the bottom of the advertisement declaring this answer to be incorrect. The very common mistake was made by these men of basing their percentage expense upon the selling price, their percentage of profit on the cost price, and expecting they would get accurate results. This was the whole source of the trouble.

Here is the proper way to tackle a problem of this character: The article costs $1.00. Your cost of doing business is 22 per cent., and you want to make a net profit beyond that of 10 per cent.—a total of 32 per cent. The cost figure of $1.00, therefore, represents 68 per cent. of the final selling price. Is this perfectly clear? Suppose, again, your expense is 40 per cent., and you want to make a net profit of 10 per cent. You would then have to realize a total profit on the selling price of 50 per cent. Now considering 100 per cent. as the final price you get, and subtracting 50 per cent. of this for profit, you have left a residum of 50 per cent. for cost, and the $1.00 which you pay for the article therefore represents 50 per cent. of your selling price. You must consequently

double the cost and sell the article for $2.00 if you want to realize your 40 per cent. of expense and your 10 per cent. of net profit.

Reverting now to the first example which I mentioned, that of an article which costs $1.00, and on which it is desired to make 35 per cent. gross, it may be seen right away that the cost is 65 per cent. of the desired selling price. Your problem may then be stated as follows:

$$\$1.00 : 65 :: X : 100$$

and the answer is $1.54. Instead, therefore, of selling the article for $1.35, you sell it for 19 cents beyond that. And this 19 cents means just the difference between making money and losing it. It means the difference between figuring profits correctly and figuring them incorrectly. It means the difference between ignorance and wisdom.

In this connection a few rules may be of assistance. In order to make a profit of 16⅔ per cent. of the sale price, add 20 per cent. to the cost; for a 20-per-cent. profit add 25 per cent.; for a 25-per-cent. profit add 33⅓ per cent.; for a 33⅓-per. cent profit add 50 per cent.; for a 40-per cent profit add 67 per cent.; for a 50-per-cent. profit add 100 per cent.

4. *They lose money without knowing it.* Partly because of the inaccurate method of figuring profits, which I have just been considering, and partly because department records are not kept, many druggists fail to realize a profit on some of their goods. It is pretty well known that patent medicines, for instance, bought at 68 cents and sold at 80 or 85 cents, very frequently fail to reimburse the druggist even for his cost of doing business, to say nothing of yielding net profits. But it is less frequently known that sometimes even the candy and cigar departments are poor profit makers.

Some years ago we had a statement from a druggist in the West whose annual business amounted to a little over $16,000. He kept careful department records and he found that his annual soda sales were nearly $4,000, his cigar sales over $6,000, and his candy sales something like $1,600. The soda business yielded him a gross profit of 35 per cent., the cigar business 16 per cent., and the candy business 25 per cent. Now his percentage expense was 28, and it was even 25 when, for purposes of calculation purely, his own salary as proprietor had been eliminated. He found, therefore, that he was losing money on his cigar business. Without considering his own salary at all as part of his expense, he was still losing 7 per cent., failing by this margin to make any profit whatever toward his own living, letting alone the question of surplus profits. Even his candy business, netting a profit of 25 per cent., lost money for him. It paid a little toward his salary, it is true, but it failed to measure up to his total real expense of 28 per cent.

I haven't any doubt at all that much the same thing would be true of many drug stores throughout the country. It doesn't follow, however, that because a given line is failing to yield adequate profits, it should be thrown overboard. When I read a paper on this subject before the Michigan State Parmaceutical Association last year I was taken severely to task by one or two speakers who misinterpreted

my position. They assumed my argument to be that goods which didn't yield a profit shouldn't be carried in stock. They declared with perfect truth that it costs more to sell some goods than it does others. A patent medicine, for instance, which can be quickly wrapped and passed out over the counter can probably be handled for one-third the expense of a prescription. Much the same thing is true of cigars, which are sold with a good deal of rapidity. It is therefore scarcely fair to charge up against such things the average percentage expense of the whole business.

Furthermore, some things have to be carried even if they do lose money. This is noticeably true of patent medicines. It may even be true with cigars and candy, for if you throw out a given department, and put nothing else in its place, you are reducing your volume of sales and thereby increasing your volume of expense. You are therefore jumping from the frying pan into the fire. Charles H. McConnell, proprietor of the Economical Drug Store in this city, whose daily sales exceed a thousand dollars, found many years ago that his soda and cigar departments were actually losing money for him, and he promptly abandoned them. But it was possible for this aggressive man, with a fine down-town location, to take a radical step of this kind when it is frequently not possible for a small druggist in an outlyng suburb. Mr. McConnell was able to keep up and even increase his volume of sales by a more energetic drive on other features of his business, but this the small druggist cannot always do.

Someone might reply, then, what's the use of all this talk if we must keep our departments anyway? A lot of use! Every man ought to know the facts about his business. In the first place, if he finds that his candy department isn't yielding adequate profits, he can change the selling prices, or the character of the goods, in such manner as to come out whole on the business, and he can perhaps find leaks and stop them up. The same thing is true to a limited extent of the cigar department. In the second place, if a druggist realizes that he is making a low profit on a good many things in his store, he then understands the vital necessity of putting in such additional lines, and of getting such increased profits elsewhere, as will bring up his *general average* of profit. It must be obvious to every merchant that as *few* goods as possible should be sold at a gross profit below the percentage expense, and as *many* as possible above it. By no other rule can a satisfactory average be yielded. If it is necessary to carry a lot of stuff that pays indifferently, the thing to do is to expend a little gray matter in planning to put in other things that will pay handsomely and bring up the average.

5. *They don't keep the percentage of expense and the percentage of gross profit far enough apart.* This shortcoming grows out of what has been said already. I found from the statements of the 25 druggists to whom reference has been made that the average percentage of expense was 24½, and the average percentage of gross profit 38⅔. This means, in round numbers, an average *net* profit of 14 per cent. Every druggist should strive to keep his percentage of expense and his percentage of gross profit this distance apart from one another. Make your business yield 14 per cent. net on the average if you can. Hold this up to yourself as an eminently attainable ideal and strive in every way to realize

it. Others have done it—you can. Don't be satisfied with anything less. If you are, then you fall to this extent below the general average reached by druggists throughout the country.

It is my conviction that the net profit ought never to fall below 10 per cent. at the worst. Anything between this figure and the general average of 14 per cent. might possibly be considered fairly satisfactory. But if 10 per cent. is not realized, then the business needs to be looked into most carefully. Throw the searchlight on it in every detail. Conduct an investigation of the most earnest character—and don't neglect to appoint yourself your own most heartless and ruthless critic.

The difficulty of the problem must not be minimized. In striving for an average gross profit of 38 per cent.—one might better make it 40 while he is at it—it will be found that many things will have to be marked up to a selling price once, twice and occasionally three times the cost price. As Charles R. Sherman, the shrewd pharmaceutical merchant of Omaha, once said: "One of the most important points in the conduct of a business is knowing where to put the profit on, and while 20 per cent. profit would be all the traffic would bear in some instances, 80 or possibly 120 per cent. on another article would seem no more burdensome to the purchaser and would really be just as legitimate."

It must be understood that 40 per cent. on the selling price is the equivalent of 67 per cent. on the cost price, and that in realizing an advance of 67 per cent. over the cost of an article, you are putting on "all the traffic will bear" in many cases. But since this is to be your *average* profit, and not your *maximum* profit, and since you have to sell a lot of things at 15 or 20 per cent., you must summon up your nerve and tack on the advances wherever the weight can be borne. This is positively the only way you can break even. Remember this finally: If it costs you 25 per cent. to do business, which is the general average the country over for retail druggists, this is equivalent to 33⅓ per cent. on the cost figures. When, therefore, you buy an article for $1.00, and sell it for $1.33⅓, you are simply paying expenses and haven't made a cent! Don't forget this—it's a good thing to remember! A selling price of $1.33⅓ on an article costing you $1.00 hasn't netted you anything!

6. *They don't take advantage of their cash discounts.* Few druggists realize how much money they can save by availing themselves of cash discounts as they should, nor do they comprehend thoroughly that if they can cut down the cost of their goods in this manner they are certainly adding that much to what is yielded by them on sale. In a paper read last year I gave the facts about seven pharmacists who had always made it a practice to discount all their bills. The annual amounts saved by them were as follows: $150.00, $186.00, $301.26, $600.00, $600.00, $1,000.00, $5,000.00. Since that time two or three other druggists have written me about this feature of their business. A physician out West, who owns a drug store but who hires a manager to conduct it, told me that with a business of about $10,000 a year he was saving on an average $150.00 annually by discounting all his bills. In his case this meant an enlargement of the total net profit realized from the business of something like 8 per cent! In another case, that of

a Michigan druggist, $196.00 was saved last year in cash discounts. A saving of $196.00 a year is equivalent to the net profits on sales amounting to $1,500.00 or $2,000.00—in other words,one would have to increase his business to this extent to make as much money as he can make without any trouble whatsoever by merely taking advantage of his cash discounts. And yet druggist after druggist goes to sleep on this opportunity, and pays anywhere from 1 to 4 or in some instances 6 per cent. more for his goods than he should.

These are a few of the reasons why some druggists don't make more money. I haven't tried to exhaust the whole catalogue of shortcomings—but I have already talked long enough. Neither do I mean to suggest for a minute that druggists are any worse than other retail merchants. They aren't. But I am convinced in my own mind that as a class they do not make that close economic study of their business which the times demand. They are scientific pharmacists—but they are not scientific business men. Modern business is just as much of a science as astronomy or biology or engineering. The old shipshod methods won't go—we are either up-to-date or out-of-date.

THE OLD ORDER CHANGETH.

It is futile, though human, to lament the passing of the old-time apothecary, with his intimate knowledge of the drug from the appearance of the first seed leaf in the field or in the garden up to the time when it left his store in the form of an infusion or decoction. The regret has no warrant in the ultimate result accomplished, so far as the medicinal products are concerned. The most that the most skillful pharmacists could hope to accomplish under the old regime is accomplished under the new more expeditiously, more economically and more uniformly by the skilled manufacturer.

But the field which has been narrowed for the pharmacist in one direction has been widened for him in another. If the modern successor to the old-time apothecary has a scientific bent he will find an outlet for it in bacteriology, and in carrying out microscopical and chemical investigations for the physician. Scientific training, moreover, need not be wholly lost in the purely commercial aspects of the business. Indeed, there has quite recently grown up a science of commerce, which consists in the application of scientific methods to the solution of commercial problems, and the trained exponents of this new science of commerce terming themselves efficiency engineers, industrial organizers, etc., have shown that even in the smaller details of industrial and commercial callings the application of scientific principles may be made the basis for material reduction in effort and increase in efficiency. While the individual pharmacist may have been the loser by newer developments in the making of medicines, the world as a whole is the better off, and it is the type which must profit, even at the cost of the single life.—*American Druggist.*

Section on Scientific Papers

Papers Presented at the Fifty-Ninth Convention

THE PREPARATION, QUALITY AND TESTING OF QUININE TANNATE.

W. A. PUCKNER AND L. E. WARREN.

Quinine is one of the very few specifics known to medicine. It is probably more used than any other single remedy. Because of the extremely bitter taste of its soluble salts its administration, especially to children, is a perplexing problem. Many attempts have been made to overcome this difficulty but few of them are without objections. The administration of the alkaloid in capsules or coated tablets is fairly satisfactory but most children and some adults cannot be induced to swallow these. Suspension of the alkaloid or some of its sparingly soluble compounds in flavored syrup has met with moderate success. Besides the alkaloid itself the most common combinations which are administered in this way are the sulphate, salicylate, tannate and certain esters.

Quinine tannate has been known in medicine for a very long time and the literature concerning it, although chiefly of pharmaceutical interest, is extensive. It is employed chiefly because it exhibits the quinine in an extremely insoluble form, one part of the salt requiring several thousand parts of cold water for solution. The salt is official in the Austrian, Danish, Dutch, German, Hungarian, Russian, Spanish and Swiss Pharmacopœias. Numerous methods have been proposed for the preparation of quinine tannate. In most of them quinine sulphate is employed as the starting point. This is dissolved in very dilute sulphuric acid and the solution precipitated with a solution of tannic acid containing a small amount of alkali, usually sodium bicarbonate or ammonia. In other methods the acetate or the hydrochloride of the alkaloid is employed and in some the precipitation is made in a hydro-alcoholic menstruum. The precipitate is then freed from soluble impurities more or less completely by washing.

Since the literature of quinine tannate is so voluminous and since it deals for the most part with unimportant modifications of processes for making the salt, no attempt is here made to review any except a few of the more important papers.

Between the years 1875 and 1885 Rozsnay,[1] a Hungarian pharmacist, perfected a process for preparing quinine tannate which produces a salt of great purity. For a time the method remained a secret but later the details became known and the process has now been incorporated in several of the pharmacopœias. By the process which Rozsnay introduced the salt is prepared in the usual way, washed with a small quantity of water and is then melted in hot water. By this process the small individual particles coalesce and the substance is thereby rendered less

[1] Pharm. Zentralhalle, 16, 106 (1875).
New Remedies, 12, 274 (1883).

bitter. On pouring off the supernatant liquid the quinine tannate is left as a resin-like mass which soon solidifies and may then be powdered and dried.

A process for preparing quinine tannate which was quite popular a quarter of a century ago deserves mention.[2] Quinine was first prepared by precipitation from the solution of the sulphate of the alkaloid with solution of sodium carbonate. The precipitate was washed and dissolved in alcohol. The alcoholic solution was then poured slowly into an aqueous solution of tannic acid. The precipitate after washing and drying was light in color and practically tasteless. Because of its expensiveness, owing to the alcohol used, and because of the low alkaloidal content of the finished product (about 20 per cent.) the method is no longer used.

The therapeutic efficiency of quinine tannate has been questioned. Many years ago, Hager[3] reported that from the results of experiments upon his own person and upon others he had concluded that this salt has only about one-tenth of the value of quinine sulphate. His conclusions, however, cannot be considered authoritative since he states that nine-tenths of the alkaloid may be recovered from the urine and feces. He evidently assumes that the alkaloid eliminated by the urine is inert, a conclusion which, in the light of present knowledge, is not justified.

Some years after Hager's report was published Field[4] experimented with the solubility of quinine tannate in gastric juice. He prepared artificial gastric juice and also collected the natural secretion from a healthy dog. He attempted to dissolve the quinine tannate in these solutions but found that the salt was practically insoluble. From the results of his experiments, which also included the administration of the drug to the human subject, the author concluded that quinine tannate is practically inert as a medicinal substance. It would appear that this conclusion, so far as it is based upon the solubility of the salt in gastric juice, is untenable because the salt is prepared by precipitation from a slightly acid solution and it could not, therefore, be expected to dissolve appreciably in gastric juice. Field pointed out that even if the salt were absorbed in the stomach of the patient, the ingestion of such large proportions of tannic acid might be very undesirable.

On the other hand Zeig[5] contends that the salt is active. He states that if a grain of the salt be dissolved in an ounce of very dilute hydrochloric acid at a temperature of 140° F. (60° C.) the solution will possess a taste as bitter as that of a control using an equivalent amount of quinine sulphate.

Christian[6] working in Koch's clinic has studied the efficiency of some of the difficultly soluble quinine salts and esters. He administered known quantities of the alkaloidal combination, collected the urine of the patients and extracted the alkaloid therefrom, the percentage of alkaloid excreted being considered as the

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[2]Pharm. Zentralhalle, 23, 550 (1882).
Am. Druggist, 16, 68 (1887).
[3]Pharm. Zentralhalle, 13, 247 (1872).
[4]Phys. Surg., 5, 353 (1883).
Proc. Am. Pharm. Assn., 21, 379 (1873).
Pharm. Rec., 4, 5 (1884).
Proc. Am. Pharm. Assn., 32, 308 (1884).
[5]West. Druggist, 15, 361 (1893); from Proc. Cal. Pharm. Assn. (1892).
Proc. Am. Pharm. Assn., 42, 651 (1894).
[6]Deutsch. Med. Woch., 29, 216 (1903).

efficiency criterion. While a number of experiments were carried out with such compounds as euquinine and saloquinine only two tests with quinine tannate were recorded. From one of these 13.18 per cent. of the alkaloid given was recovered and from the other 23.79 per cent.

From the conflicting results of these inadequate and for the most part unscientific experiments, it can be seen that the question of the therapeutic efficiency of the salt is still an open one. It is to be hoped that the value of quinine tannate will be determined by scientific experimentation.

But few reports of examinations of commercial quinine tannate have appeared. In 1879 Jobst[7] examined several specimens of the preparation, the method of manufacture of which was unknown to him, and at the same time several factory specimens of known origin were studied. The examination revealed great variations in composition, not only in respect to the content of water and total alkaloid, but also in the *kind* of alkaloid, as several of the commercial specimens contained mixtures of the cinchona alkaloids. His findings are tabulated below:

Method of Manufacture	Water (Loss at 120°) Per Cent.	Quinine, Per Cent.	Quinidine, Per Cent.	Cinchonidine Per Cent.	Cinchonine Per Cent.
Known	7.2	31.37			
Known	9.7	22.72			
Known	10.7	10.00			
Known	11.4	7.40			
Unknown	9.1	4.46	11.97	7.33	
Unknown	9.8	4.93	2.43	13.10	3.35
Unknown	10.2	6.23	Trace	20.80	Trace

He assigns the formula, $C_{20}H_{24}O_2N_2.2C_{14}H_{10}O_9+4H_2O$, as the most probable one for the salt having the highest quinine content, viz., 31.37 per cent. The total alkaloidal content was determined by mixing with freshly slacked lime, drying and extracting the pulverized mass with chloroform. As the author's methods for the quantitative separation of the several alkaloids are not given, no estimate of the accuracy of the recorded results can be made. Water was determined by drying at 120°. From the results of his experiments he concluded that tannic acid is capable of forming very variable compounds with quinine according to the proportion and manner in which it is employed in the manufacture of the combination. To obtain products of even an approximately constant composition definite quantities of tannic acid and of quinine must always be employed.

In 1889 Neumann[8] examined four commercial specimens of quinine tannate while testing a method which he had worked out for the assay of the product. The quinine content varied between 13.9 per cent. and 28.8 per cent., three of the specimens assaying more than 25 per cent. of the alkaloid. These results, however, could not be considered as authoritative as controls indicated that the method gave values about 3 per cent. too high.

In 1892 Zeig[9] stated that he had found the alkaloidal content of commercial

[7] Arch. Pharm., 212, 331 (1878).
Proc. Am. Pharm. Assn., 26, 578 (1878).

[8] Zeit. anal. Chemie, 28, 663 (1889).
Proc. Am. Pharm. Assn., 38, 673 (1890).

[9] West. Druggist, 15, 361 (1893); from Proc. Cal. Pharm Assn. (1892).
Proc. Am. Pharm. Assn., 42, 651 (1894).

specimens of quinine tannate to vary between 10 and 25 per cent. but he gave no information concerning the number of specimens examined nor of the names of the brands studied.

Quinine tannate having been considered by the Council on Pharmacy and Chemistry of the American Medical Association, the association laboratory took up the examination of the several brands of the product on the American market. At the same time specimens of the salt were prepared by various methods and these were included in the examination. Tentative academic standards for the substance were prepared and submitted for criticism to several manufacturers of pharmaceutical chemicals whom it was thought might be interested.

LABORATORY SPECIMENS.

The method of manufacture first employed was that of the Swiss Pharmacopoeia. Briefly the method is as follows:

Nine parts of quinine sulphate are dissolved in a mixture consisting of 16 parts diluted sulphuric acid and 300 parts of water. Twenty-one parts of tannic acid and 3.5 parts of sodium bicarbonate are dissolved in 300 parts of water without the application of heat. This solution is poured with constant stirring into the solution of quinine sulphate. The resultant precipitate is washed with water until the washings, after acidification with nitric acid, cease to give a turbidity with barium nitrate solution.

In preparing the salt by this method it was found impracticable to follow the directions concerning the washing to completion, as the precipitate was of such bulk that the sulphate could not be completely removed. Although the standard of the Swiss Pharmacopoeia requires that the salt shall contain from 30 to 35 per cent. quinine, the laboratory specimen prepared as above contained but about 25.8 per cent. alkaloid. Quinine was determined by suspending the salt in weak ammonia water, shaking the mixture with successive portions of chloroform until extraction was complete, evaporating the solvent, drying the residue at 100°, and weighing the alkaloid.* Water was determined by drying at 100° C. This specimen lost 7.6 per cent. of its weight on drying. In the appended table of analytical results it is designated as "No. 1."

A leading manufacturer of quinine salts, having criticised the Swiss method of manufacture (the method included in the tentative academic standards which were submitted to the manufacturers) in respect to the proportions of the several ingredients used, a specimen was prepared in the laboratory by the Swiss method but using the quantities suggested by this manufacturer, which were as follows:

Quinine sulphate	8.4 parts
Diluted sulphuric acid	15.0 "
Tannic acid	15.0 "
Sodium bicarbonate	3.0 "

The manufacturer stated that these proportions would yield a product corresponding very nearly to the formula, $C_{20}H_{24}O_2N_2(HC_{14}H_9O_9)+4H_2O$, and containing 31.16 per cent. anhydrous quinine, 61.91 per cent. tannic acid and 6.93 per cent. water. The laboratory specimen prepared according to the manufacturer's suggestion contained 31.3 per cent. alkaloid and lost 9.0 per cent. of its weight on drying. This specimen is designated as "No. 2" in the table of analytical results.

Quinine tannate was prepared by the method of the Hungarian Pharmacopoeia,

*This method is described in greater detail in the tentative description for Quinine Tannate given elsewhere in this paper.

aliquot parts of the prescribed quantities being used. The following is the method as used:

Ten parts of quinine sulphate are dissolved in 150 parts of distilled water by the aid of the smallest necessary quantity of diluted sulphuric acid. Twenty parts of tannic acid are dissolved in 140 parts of water and the filtered solution poured with constant stirring into the solution of quinine sulphate. A mixture of 5 parts of tannic acid, 80 parts of water and 5 parts of ammonia water is filtered and poured slowly and with constant stirring into the quinine-tannin mixture prepared as above described. The resultant precipitate is collected on a filter and washed with 80 parts of water. The mass is then gently expressed and warmed with 40 parts water until it melts to a resin-like mass. It is then dried and pulverized.

Although the Hungarian Pharmacopoeia requires that the salt shall contain from 30 to 32 per cent. anhydrous quinine the laboratory specimen prepared as above described contained but about 25 per cent. alkaloid. In drying the specimen lost about 10 per cent. of its weight. (In the table of analytical results this specimen is designated as "No. 3.")

The salt was then prepared by the method of the Hungarian Pharmacopoeia except that the quantities of the several ingredients used were modified to conform to the proportions employed in the preparation of "No. 2." Ammonia water was used as the precipitant. The following quantities were used:

Solution 1—Quinine sulphate	8.4	gm.
Diluted sulphuric acid	15.5	c.c.
Water	150.0	c.c.
Solution 2—Tannic acid	10	gm.
Water	70	c.c.
Solution 3—Tannic acid	3	gm.
Ammonia water	5	c.c.
Water	50	c.c.

This laboratory specimen prepared as above contained 28.7 per cent. alkaloid and lost 10.0 per cent. of its weight on drying. The specimen is designated as "No. 4" in the table of analytical results.

Another specimen was prepared exactly like "No. 4" except that sodium bicarbonate was used as the precipitant instead of ammonia water, 3 gm. being used. This specimen contained 33.3 per cent. alkaloid and lost 7.2 per cent. of its weight on drying. It is designated as "No. 5" in the table of analytical results.

Quinine tannate was prepared by the method official in the German Pharmacopœia. Essentially this is the Rozsnay method, official in the Hungarian Pharmacopoeia, but it has been modified in one important particular. It is directed that after the salt has been dried in a warm place, it is to be dried at 100° C. The preparation of a specimen by this method was begun and completed through the stage of drying at 30° to 40° C. The air-dried specimen was then divided into two equal portions and one of them was dried at 100° C. as directed. The two sub-divisions were then compared. The air-dried specimen was a drab colored, moderately bulky powder which did not adhere to the surfaces of glass or paper. It contained 25.8 per cent. quinine and the loss on drying at 100° C. amounted to 9.8 per cent. The portion which had been dried at 100° C. was somewhat darker in color than the other, was slightly less bulky, and adhered to glass and paper in a troublesome way. It contained 27.8 per cent. of quinine. These specimens are respectively designated in the table of analytical results as "No. 6" and "No. 6-a." The German Pharmacopoeia requires that the salt shall contain at least 30 per cent. of quinine.

Another specimen was prepared by the following method:

Ten gm. of quinine sulphate are dissolved in a mixture of 15 c.c. of diluted sulphuric acid and 300 c.c. of water. Twelve gm. tannic acid are dissolved in 100 c.c. water and the filtered solution poured slowly and with constant stirring into the solution of quinine sulphate. Six gm. tannic acid are then dissolved in 50 c.c. water and 2 gm. sodium bicarbonate dissolved in the solution. This solution is filtered and the filtrate poured slowly and with constant stirring into the quinine-tannin mixture prepared as above described. The precipitated quinine tannate is allowed to stand for 24 hours. It is then poured onto a muslin filter, washed with 100 c.c. water and expressed with moderate pressure. The expressed mass is then transferred to a porcelain dish, 100 c.c. water added and the mixture heated on the water bath until the quinine tannate melts to a resin-like mass. The supernatant liquid is poured off, the mass dried in the air, and pulverized.

This specimen contained 29.3 per cent. alkaloid and lost 7.9 per cent. of its weight on drying. It is designated as "No. 7" in the tabulated analytical results.

As it seemed probable that the amount of sodium bicarbonate was too small to obtain a salt containing the maximum amount of alkaloid, the experiment was repeated with some variations. Three gm. sodium bicarbonate were employed instead of two and the amounts of solvent in some cases were changed. The details of the variations may be seen by consulting Table I. This process yielded 22.2 gm. of the salt (from 10 gm. quinine sulphate), and the specimen ("No. 8" in table II) contained 29.1 per cent. alkaloid and the loss on drying amounted to 7.3 per cent.

In the hope of obtaining a salt with a higher alkaloidal content another specimen was prepared by the same method as was used in "No. 8" except that 4 gm. sodium bicarbonate were used as the precipitant. The quantities of the several ingredients used may be seen by consulting Table I. This specimen was very dark colored and otherwise objectionable in appearance. The yield was less than that obtained by some of the other methods and the product was less bulky. It contained 34.2 per cent. of quinine and lost 8.1 per cent. of its weight on drying. This specimen is designated as "No. 9" in Table II.

Another specimen was prepared by a method which is very similar to that used in the preparation of "No. 8," the quantities of the several ingredients used being given in Table I. This specimen contained 33.7 per cent. alkaloid and lost 7.7 per cent. of its weight on drying. It is designated as "No. 10" in Table II.

A general idea of the variations in the processes used in the preparation of the several specimens may be gained by a study of Table I. In this table the composition is given of the several "solutions" used in the manufacture of each specimen. It is to be understood, of course, that precipitation is brought about by mixing the several solutions.

From the results of the experimental work it is concluded that it is easily possible to obtain quinine tannate containing over 30 per cent. of anhydrous quinine, but that this desideratum is not attainable if the substance be prepared by any of the methods now official in the pharmacopoeias. Sodium bicarbonate is more satisfactory as a precipitant than ammonia water, but it is essential that an excess of the alkali be avoided. While the observations and experiments are too few to warrant a positive conclusion, it appears that if ammonia water be used as the precipitant, the yield of the finished product will be larger than is the case when sodium bicarbonate is employed. The quinine content, however, is

proportionately smaller. The observation of Jobst that in order to obtain products of even an approximately constant composition it is necessary to employ definite proportions of tannic acid and of quinine has been confirmed by our experiments.

TABLE I

Solution		1	2	3	4	5
1	Quinine sulphate.....	9	8.4	10 gm.	8.4 gm.	8.4 gm.
	Diluted sulphuric acid.	16	15.0	q. s.	15.5 cc.	15 cc.
	Water	300	300	150	150 cc.	150 cc.
2	Tannic acid			20 gm.	10 gm.	10 gm.
	Water			140 cc.	70 cc.	70 cc.
3	Tannic acid	21	15			3 gm.
	Sodium bicarbonate....	3.5	3			3 gm.
	Water	300	300			50 cc.
4	Tannic acid			5 gm.	3 gm.	
	Ammonia water			5 cc.	5 cc.	
	Water			80 cc.	50 cc.	
5	Sodium bicarbonate....					
	Water					
6	Tannic acid					
	Water					

Solution		6—6a	7	8	9	10
1	Quinine sulphate.....	4 gm.	10 gm.	10 gm.	10 gm.	10 gm.
	Diluted sulphuric acid.	q. s.	15 cc.	15 cc.	15 cc.	15 cc.
	Water	120 cc.	300 cc.	150 cc.	150 cc.	150 cc.
2	Tannic acid	8 gm.	12 gm.	12 gm.	12 gm.	12 gm.
	Water	50 cc.	100 cc.	100 cc.	75 cc.	75 cc.
3	Tannic acid		6 gm.			
	Sodium bicarbonate....		2 gm.			
	Water		50 cc.			
4	Tannic acid	2 gm.				
	Ammonia water	2 cc.				
	Water	32 cc.				
5	Sodium bicarbonate....			3 gm.	4 gm.	3 gm.
	Water			40 cc.	50 cc.	50 cc.
6	Tannic acid			3 gm.	3 gm.	3 gm.
	Water			25 cc.	50 cc.	50 cc.

COMMERCIAL SPECIMENS.

Four specimens of quinine tannate bearing the labels of as many manufacturers were purchased and examined with particular reference to the alkaloidal content and to the loss on drying at 100° C. These specimens are designated as Nos. "11," "12," "13" and "14." Specimen "No. 11" contained 29.3 per cent. anhydrous quinine and the loss on drying the specimen amounted to 7.9 per cent. of the original weight. Specimen "No. 12" contained 29.5 per cent. of quinine and the loss on drying amounted to 6.5 per cent. Specimen "No. 13" contained about 33.4 per cent. of alkaloid and the loss on drying amounted to 8.0 per cent. Specimen "No. 14" contained about 34.0 per cent. total alkaloid and the loss on drying amounted to 9.0 per cent. This specimen contained a considerable quantity of uncombined alkaloid to which reference will again be made.

The amount soluble in anhydrous ether under specified conditions was determined, not only in the specimens purchased, but also in those prepared in the laboratory. Tests for chloride and sulphate were also carried out and an attempt was made to obtain some idea of the relative bitterness of the several specimens examined.

Ether-Soluble. Preliminary tests indicated that one of the specimens contained considerable amounts of uncombined alkaloid. Accordingly the amount soluble in dry ether was determined as follows:

Two gm. quinine tannate were placed in a beaker, 25 c.c. anhydrous ether poured upon it and the mixture stirred with a glass rod. After allowing the suspended salt to settle the supernatant liquid was poured through a dry filter into a tared flask. The insoluble residue was similarly treated twice more with 25 c.c. portions of dry ether and the filter finally washed with 10 c.c. of the solvent. The united filtrates were distilled, the residue dried at 100° C. and weighed. As quinine tannate is slightly soluble in anhydrous ether a weighable residue may always be expected.

When tested by the above described method, the several specimens, with a single exception, gave residues varying not far from 0.1 per cent. to 0.3 per cent. One specimen ("No. 19") contained about 9 per cent. ether-soluble matter, which latter appeared for the most part to consist of free-alkaloid.

Chloride and sulphate. One gm. of quinine tannate was thoroughly shaken with 100 c.c. of water and the mixture allowed to settle. The supernatant liquid was poured through a filter, the filtrate acidified with diluted nitric acid and the usual tests for chloride and sulphate applied. With one exception each specimen contained appreciable amounts of sulphate and traces of chloride. In this one exception sulphate was absent, but considerable amounts of chloride were present, thus indicating the probable source from which the salt had been prepared.

Bitterness. One gm. of the salt was shaken with 100 c.c. of water and filtered. The filtrates from several specimens were then compared by tasting. While none of the filtrates were free from bitterness in general, the relative bitterness was found to coincide with the relative turbidity found in the tests for chloride or sulphate. Specimen "No. 14," which contained a large amount of free alkaloid, was much more bitter than any of the others, although it is described upon the label as "Neutral-Tasteless."

The results found from the several specimens examined are tabulated below:

Number or brand	Anhydrous quinine	Water (Loss at 100°)	Ether-soluble	Sulphate
1	25.75	7.64	0.17	Very marked turbidity
2	31.33	9.01	0.08	Very marked turbidity
3	25.02	9.96	0.10	Faint turbidity
4	28.70	9.96	0.05	Marked turbidity
5	33.31	7.20	0.11	Faint turbidity
6	25.85	9.78	0.08	Faint turbidity
6-a	27.82		0.09	Faint turbidity
7	29.33	7.94	0.09	Faint turbidity
8	29.12	7.35	0.12	Faint turbidity
9	34.25	8.12	0.09	Faint turbidity
10	33.72	7.74	0.08	Faint turbidity
11	29.30	7.88	0.10	Distinct turbidity
12	29.51	6.50	0.19	Absent
13	33.36	8.05	0.36	Distinct turbidity
14	33.97	9.06	9.02	Very faint opalescence

Number or brand	Chloride	Taste of filtrate	Yield (in gm.) calculated from 10 gm. quinine sulphate	Remarks
1	Noticeable opalescence	Noticeably bitter		
2	Very faint opalescence	Noticeably bitter		
3	Very faint opalescence	Slightly bitter	31	
4	Very faint opalescence	Slightly bitter		
5	Very faint opalescence	Slightly bitter		
6	Very faint opalescence	Slightly bitter	28.8	
6-a	Very faint opalescence	Slightly bitter	26.0	Adheres to glass and paper
7	Very faint opalescence	Slightly bitter		
8	Very faint opalescence	Slightly bitter	23.2	Dark color
9	Very faint opalescence	Slightly bitter	20.0	
10	Very faint opalescence	Slightly bitter	20.6	
11	Noticeable opalescence	Noticeably bitter		
12	Very marked opalescence	Noticeably bitter		Evidently prepared from quinine hydrochloride
13	Noticeable opalescence	Noticeably bitter		
14	Very faint opalescence	Very bitter		

From the results of the examination it is seen that commercial quinine tannate varies somewhat in composition. Doubtless this is due to slight differences in the manufacturing methods of the various makers. However, with the exception of specimen "No. 14," which bears evidence of careless manufacture, the several makes of quinine tannate on the American market may, on the whole, be regarded as of sufficiently uniform composition for practical purposes.

Based upon the provisional academic standards as first prepared but modified as found necessary by the results of the experimental work, and by the suggestions offered by those to whom the provisional description was submitted for criticism, tentative standards for quinine tannate have been prepared. Our thanks are due to those manufacturers who have made suggestions and criticisms in the preparation of these provisional standards for quinine tannate. The description and standards suggested are as follows:

QUININE TANNATE.—Quininæ Tannas. Quinine tannate is the tannate of the alkaloid, quinine, containing from 30 to 35 per cent. of quinine.

Quinine tannate may be prepared as follows:

Ten gm. of quinine sulphate are dissolved in a mixture of 15 c.c. of diluted sulphuric acid and 150 c.c. of water. Twelve gm. tannic acid are dissolved in 75 c.c. water and the filtered solution poured slowly and with constant stirring into the solution of quinine sulphate. Three

gm. tannic acid are then dissolved in 50 c.c. water and 3 gm. sodium bicarbonate dissolved in 50 c.c. water. These solutions are filtered, the filtrates mixed, and the mixture poured slowly and with constant stirring into the quinine-tannin mixture prepared as above described. The precipitated quinine tannate is allowed to stand for 24 hours. It is then poured onto a muslin filter, washed with 100 c.c. water and expressed with moderate pressure. The expressed mass is then transferred to a porcelain dish, 50 c.c. water added and the mixture heated on the water bath until the quinine tannate melts to a resin-like mass. The supernatant liquid is poured off, the mass cooled, dried in the air and pulverized.

Quinine tannate is an amorphous, pale lemon-yellow to yellowish-white, odorless powder without taste, or at most slightly bitter, and with scarcely any astringency. It is slightly soluble in water, ether and chloroform, but somewhat more soluble in alcohol. The aqueous and alcoholic solutions are colored bluish-black by ferric chloride test solution. Quinine tannate melts on heating in a glass tube to a purplish, tar-like material.

If 1.0 gm. of quinine tannate be shaken with a mixture of 50 c.c. of water and 1 c.c. nitric acid and the mixture filtered, a portion of the filtrate should not become more than slightly opalescent after the addition of 1 c.c. of silver nitrate test solution; nor should there by any darkening after the addition of 1 c.c. of hydrogen sulphide test solution; nor should a portion be rendered turbid immediately by barium chloride test solution.

If from 0.5 gm. to 1.0 gm. of quinine tannate be mixed with 25 c.c. water and an excess of ammonia water, the mixture extracted with three successive portions of 20 c.c. each of chloroform, the total solvent washed with water and evaporated, the weight of residue obtained after drying at 100° C. should correspond to from 30 to 35 per cent. of anhydrous quinine. If this residue be dissolved in 30 c.c. of water by the aid of a few drops of diluted hydrochloric acid and 1 c.c. of the solution be mixed with 20 c.c. of water and two or three drops of bromine test solution, the mixture should assume a green coloration on the addition of ammonia water.

If 0.2 gm. quinine tannate be ignited no weighable residue should be obtained.

If from 0.5 gm. to 1.0 gm. quinine tannate be dried at 100° C. to constant weight the loss should not correspond to more than 10 per cent. of the weight of substance taken.

If 2.0 gm. of quinine tannate be shaken with three successive portions of 25 c.c. each of anhydrous ether, the solvent poured through a filter, the filter washed with 10 c.c. of the solvent, the several filtrates united, evaporated and the residue dried to constant weight at 100° C., the weight of the residue should not exceed 0.005 gm. (limit of *uncombined alkaloid*).

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Process for manufacture of the salt by the alcohol solvent method.

1882 Anonymous.
New Remedies, 11, 173.
Proc. Am. Pharm. Assn., 30, 414 (1882).
Review of a process of manufacture which employs acetate of ammonia. Product contains 19 to 21 per cent. of quinine.

1882 Fiebert
Pharm. Zentralhalle, 23, 550; from Zeit. cest. Ap. Ver. (1882).
Proc. Am. Pharm. Assn., 31, 273 (1883).
Process of manufacture by the alcohol solvent method.

1883 Rosznay.
Proc. Am. Pharm. Assn., 32, 308; from Gy. Rund. (1883).
New Rem., 12, 274 (1883).
A method of assay. Substance is mixed with calcium and sodium hydroxides, dried, and the mass extracted with chloroform.

1883 Rother.
Am. Jour. Pharm., 55, 172.
Maintains that the compounds of quinine and tannic acid are not true salts but are analogous to the alcoholates. Suggests that they be called "tannolates." Theoretical composition discussed.

1883 Weiss.
Proc. Am. Pharm. Assn., 32, 84 (1884); from Pharm. Ztg. (1883).
Describes a method for preparing a finely divided quinine tannate in a syrup.

1883 Field.
Phys. Surg, 5, 353.
Pharm. Rec., 4, 5 (1884).
Proc. Am. Pharm. Assn., 32, 308 (1884).
Experiments with the solubility of quinine tannate in gastric juice.

1885 Schwarz.
Pharm. Zentralhalle, 26, 471; from Pharm. Ztg. (1885).
Proc. Am. Pharm. Assn., 34, 605 (1886).
Apparently the first to employ sodium bicarbonate as a precipitant in the manufacture of quinine tannate. Produced a specimen containing 33.3 per cent. of quinine.

1885 Peltz.
Pharm. Ztschr. Russ., 24, 80.
Proc. Am. Pharm. Assn., 33, 303 (1885).
Recommends the use of quinine hydrochloride in place of the sulphate in the manufacture of quinine tannate.

1889 Neumann.
Zeit. anal. Chemie, 28, 663.
Proc. Am. Pharm. Assn., 38, 673 (1890).
Describes a process for the alkaloidal assay of quinine tannate. Controls indicate that the method gives values about 3 per cent. too high. Examined several commercial specimens, the alkaloidal content of which (as found) ranged from 13.9 per cent. to 28.8 per cent.

1891 De Vrij.
Ned. Tijdschr., 3, 113.
Proc. Am. Pharm. Assn., 40, 744 (1892).
A method of preparation is described.

1892. Zeig.
West. Druggist, 15, 361 (1893); from Proc. Cal. Pharm. Assn. (1892).
Proc. Am. Pharm. Assn., 42, 651 (1894).
States that commercial quinine tannate contains from 10 per cent. to 25 per cent. alkaloid. Believes that the salt is sufficiently soluble in gastric juice to be therapeutically active.

1893 Drake.
Proc. Am. Pharm. Assn., 42, 675 (1894); from Proc. Mass. Pharm. Assn. (1893).
Describes a process of manufacture in which no alkali is employed.

1894 De Vrij.
Pharm. Zentralhalle, 35, 155.
Proc. Am. Pharm. Assn., 42, 1108 (1894).
Describes a process for preparing the salt.

1898 Rosenheim and Schidrowitz.
Jour. Chem. Soc., 73, 884.
Find that the specific rotatory power of quinine tannate in methyl alcohol solution at 15° is 40.1°.

1898 Schidrowitz.
See Rosenheim.

1900 Zeelt.
Pharm. Ztg., 45, 96; from Pharm. Wkblad. (1900).
Proc. Am. Pharm. Assn., 48, 813 (1900).
Describes a process for manufacturing quinine tannate.

1903 Christian.
Deutsch. Med. Woch., 29, 216.
Administered known quantities of quinine tannate to human beings and recovered the alkaloid excreted in the urine. In each of two experiments he recovered less than 25 per cent. of the total alkaloid given.

1906 Fränkel.
Die Arzneimittel-Synthese ed. 2, 140 (1906).
Calls attention to the possible undesirability of the large proportion of tannin in quinine tannate.

1906 Nierenstein.
Chem. Zentralhalle, 77, 11, 1417 (1906); from Collegium (1906).
Amorphous quinine tannate melts at 62-64° C.; it may be crystallized from ether by the addition of acetic anhydride; crystallized substance melts at 79-81°.

1909 Calliess.
Ap. Ztg., 24, 159.
Pharm. Zentralhalle, 50, 263, 807 (1909).
Describes a method of assay.

1910 Cohn.
Pharm. Zentralhalle, 51, 265.
Year Book Pharm., 12 (1910).
Method for manufacture.

1911 May.
Chem. Syn. Drugs, 84 (1911).
Mentions that quinine tannate is but slowly split up in the intestine and for this reason it is lacking in therapeutic promptitude and certainty.

Laboratory of the American Medical Association.

PROPOSED STANDARDS FOR CAMPHOR AND SPIRIT OF CAMPHOR.

L. D. HAVENHILL AND F. E. ROWLAND.

Spirit of Camphor and Camphor were made official in 1820. The Spirit has for many years been a very popular household remedy and in view of the fact that it has been reported as extremely variable in strength and quality by analysts in various parts of the country, it would seem desirable to introduce into the forthcoming Pharmacopoeia some special tests for determining its strength and purity. In the years that this preparation has been official, it, like many other official preparations, has been subjected several times to fancied improvements.

In general, changes of formula lead to confusion, and as these changes have many times been shown to have been ill advised, criticism has thus arisen to the effect that the committees of revision often do not give sufficient attention to them. The decennial revisions have sometimes seemed to be somewhat lacking in that definiteness of purpose which is conducive to confidence and healthy growth.

In tracing the evolution of Spirit of Camphor, several interesting changes are noted. It was official in 1820 as Tincture of Camphor, the title by which it is still known in the French Pharmacopœia. It was made by dissolving one Troy ounce of Camphor in one pint of Alcohol. This is the equivalent of about 6.14 gm. of Camphor dissolved in enough Alcohol (89.7%) to make 100 cc. There were two Pharmacopœias in 1830. That which resulted from the New York convention changed the title to Spirit of Camphor, the title by which it is known in the latest editions of the German, Swiss, British and Japanese Pharmacopœias. The Pharmacopœia which resulted from the Washington convention retained the title of Tincture. In both pharmacopœias the formula was changed to a strength of four Troy ounces of Camphor dissolved in two pints of Alcohol. This is the equivalent of about 11.54 gm. of Camphor dissolved in sufficient Alcohol (89.7%) to make 100 cc. In 1840 the Washington convention disregarded the timely change in the New York convention ten years before and continued the preparation without change until 1860. Then the title was changed to Spirit. No additional change was made in 1870 but in 1880 the formula was materially altered and the Spirit as then prepared consisted of Camphor, 10 parts, Alcohol (94%) 70 parts, and water 20 parts. This is the equivalent of about 8.72 gm. of camphor dissolved in sufficient Alcohol (80.56%) to make 100 cc.

In the light of subsequent revisions this weakening of the alcoholic strength was ill advised. In 1890 the formula was again changed and the preparation was made by dissolving 10 gm. of Camphor in sufficient Alcohol (94%) to make 100 cc. The manufacture by weight directed ten years before was discontinued. It is to be noted in this connection that of the Pharmacopœias before mentioned, the British is the only one in which this preparation is not directed to be made by weight at the present time. It has been claimed in defense of this change that the manufacture of Galenicals by weight was not popular with the Americans. This may have been so but we are inclined to the belief that this method of compounding was and is still popular with many manufacturing pharmacists, and, that it would have been desirable to have retained the formulas for compounding by weight at least as alternative ones. The diluting of the alcohol was not only discontinued but the alcoholic strength was increased beyond that of any previous formula. In the Pharmacopæia of 1900 the formula again underwent a slight change by reason of the increase in strength of Alcohol from 94 to 94.9%.

A comparison of the formulas for Spirit of Camphor as found in the foreign Pharmacopæias shows that the English method of manipulation is similar to ours, but that alcohol of 90% is used. In the German, Swiss and Japanese Pharmacopœias the compounding is by weight and the finished preparation is practically identical and approximates the formula of the 1800 Pharmacopœia. The formula of the French Pharmacopœia is composed by weight, but the alcohol used is of the same strength (90%) as that of the British Pharmacopœia.

We believe that the present U. S. P. formula is suited to the needs of the American physicians and that further tampering with it is unnecessary. All of the recent foreign Pharmacopœias give either the specific gravity or density of this preparation and this data should be included in ours. This data will enable those who so desire to manufacture Spirit of Camphor by weight. The specific gravity, however, does not seem sensitive enough to serve as a suitable standard as shown by the following: The apparent specific gravity at 20° C. of this Spirit when made with 90% alcohol would be about 0.8449, when made with 94.9% alcohol about 0.8296 and when made with alsolute alcohol about 0.8133. These figures indicate that a variation in specific gravity of about 0.003 would indicate a variation in alcoholic strength of about 1%. With a constant Camphor content the specific gravity would serve as a satisfactory measure of the alcoholic strength. The apparent specific gravity of a spirit containing 8 grammes of Camphor in each 100 cc., when made with 94.9% alcohol is about 0.8263 and for one containing 12 gm. of camphor in each 100 cc., about 0.8324. It is thus seen that here a variation of 0.003 in specific gravity would indicate a variation of about 2 gm. or 20% in the Camphor content, a variation which is in our opinion too great. For this reason we would recommend that the approximate specific gravity be given instead of a limiting range. In view of the above facts it seems to us desirable to have some recognized method for the direct determination of water in this spirit as well as a specific method for determining the allowable variation in camphor

[1]Seymour: A simple method of estimating Camphor and Alcohol in Spirit of Camphor. Proc. A. Ph. A. (1907), Vol. 55, page 443.

content. We have found that the use of anhydrous Potassium Carbonate as proposed by Seymour[1] answers very well for the detection of water.

The test for limiting the camphor content as proposed by the German and Swiss Pharmacopœias is based upon the volume of water necessary to cause a precipitation of camphor in 10 gm. of the Spirit under stated conditions. The German standard seems to us to be too lax as it seemingly allows a range of approximately 2 gm. or 20% in camphor. This is however closely in accord with their allowable range in specific gravity, 0.885 to 0.889. On the other hand the standard of the Swiss Pharmacopœia accords more closely with our ideas as it allows a variation of about ½ gm. or 5% in camphor content. This, however, is not in accord with the range allowed by the specific gravity which is the same as that of the German Pharmacopœia. The French Pharmacopœia gives the approximate density and the optical rotation but does not define the allowable variation. The precipitation method is very satisfactory when the percentage of water and the temperature are kept constant. We have ascertained at 20° C. the number of cc. of water which are necessary to cause a precipitate on 5cc. of Spirit of various strengths in U. S. P. Alcohol to be as follows:

5 cc. spirit of strength 4 gm.: 100 cc. requires 7.90 cc. of water.
5 cc. spirit of strength 5 gm.: 100 cc. requires 6.95 cc. of water.
5 cc. spirit of strength 6 gm.: 100 cc. requires 6.4 cc. of water.
5 cc. spirit of strength 8 gm.: 100 cc. requires 5.45 cc. of water.
5 cc. spirit of strength 10 gm.: 100 cc. requires 4.7 cc. of water.
5 cc. spirit of strength 12 gm.: 100 cc. requires 4.15 cc. of water.
5 cc. spirit of strength 14 gm.: 100 cc. requires 3.7 cc. of water.
5 cc. spirit of strength 15 gm.: 100 cc. requires 3.5 cc. of water.

The importance of fixing the alcoholic strength is shown by the fact that 5 cc. of a spirit made by dissolving 7.5 gm. of camphor in sufficient alcohol (90%) to make 100 cc. has the same precipitating value as 5 cc. of the official Spirit.

The description and tests which we would propose for Spirit of Camphor are as follows:

Keep in a closely stoppered bottle in a cool place.

A clear, colorless liquid, neutral to litmus paper and containing about 85 % of alcohol by volume (84.9%).

Specific gravity about 0.8296 20°/20° C.

Five cc. of the Spirit vigorously shaken in a dry, stoppered test tube with 0.5 gm. of anhydrous Potassium Carbonate should not moisten the latter within one-half hour. (Limit of water.)

Five cc. of the Spirit when cooled to 20° C. and quickly mixed with distilled water of the same temperature should require not more than 4.8 cc. nor less than 4.6 cc. of the later to produce a slight permanent precipitate of Camphor. (Indicating from 9.7% to 10.3 gm. of camphor in each 100 cc. of the Spirit.)

The alcohol and the Camphor should correspond in other respects to their respective tests.

CAMPHOR.

Camphor at the time that it was admitted to the Pharmacopœia had none of its properties mentioned and it is doubtful if standards are contemplated, but as revision succeeded revision useful pharmaceutical knowledge and tests have from

time to time been supplied until in the VIII rev. this has reached a state of approximate completeness. To what additional extent this may carried is a matter worthy of careful attention. The limit has not been reached, however, and we would suggest the following extentions.

Our experiments lead us to believe that the optical rotation of Camphor should be given in the U. S. P. IX. We have examined refined Camphor from the American Camphor Refining Company, Charles H. Phillips Chemical Company, Charles Pfizer and Company, and H. J. Baker and Brothers, as well as from several Japanese refineries and have in every case found that the rotation when observed in the form of U. S. P. Spirit in a 200 mm. tube at 20° C. with sodium light was within the limits of +8.20° and +8.26°. This would correspond, in absolute alcohol, to (a)d 15°+42.9° to +43.2°, which corresponds very closely with the figure given in the French Pharmacopœia, (a)d 15°+43°. It should be noted that the highest figure obtained by us is considerably lower than the figure given in the German Pharmacopœia (a)d 20° +44° 22°.

We would suggest that instead of the redundant words of the present U. S. P., "it is optically active, being dextrogyrate," that the angular rotation be given at not less than +8.20° when dissolved in alcohol 10 gm.; 100 cc. and observed in a 200 mm. tube at 20° C. with sodium light.

It seems to us desirable to introduce the statement that camphor is insoluble in glycerin and to extend to list of solubilities to include at least Acetone and Glacial Acetic Acid. We think that it would be also appropriate to extend the list of liquefiable substances so as to include Salol, Napithol, Pyrogallol and Resorcin. (Antipyrine and Salicylic Acid are not included in this list because they do not liquify under ordinary conditions.)

The permissible amount of non-volatile matter at a given temperature should also be stated. We have found no samples that completely volatilized at 110° C. The usual residue is approximately 0.025%.

DISCUSSION.

Dr. A. R. L. Dohme inquired as to the reason for making the requirements for Camphor such as to eliminate the synthetic product. While synthetic camphor was not on the market in such quantity as to make it an appreciable element, it would likely become an important factor in time. It is free from oil and, personally, he could see no good reason why the pharmacopœial requirement should be such as to practically eliminate it.

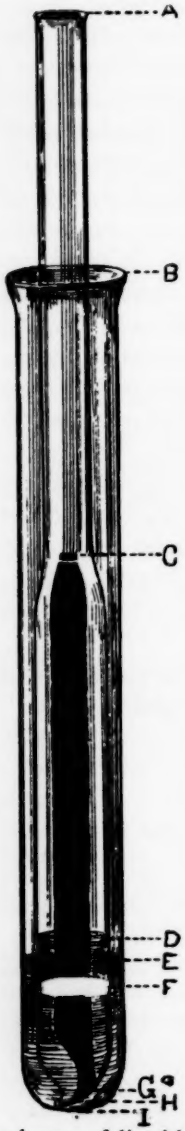
Prof. L. D. Havenhill replied that synthetic camphor had not been included because he did not know of any good reoson why it should be included. His recommendations had been guided by the countries where it was manufactured, and since the recent German Pharmacopœia had not recommended synthetic camphor for medicinal use, he could see no good reason why we should take it up.

Mr. M. I. Wilbert thought that before synthetic camphor is included it would be necessary, or at least very desirable, to show that it had the same physiological action as the natural product, since it is a well known fact that closely related compounds do not always produce the same physiological effect.

Prof. Virgil Coblentz gave it as his opinion that there was no difference between the physiological action of natural and synthetic camphor, and that whether one was used more than the other depended mainly upon the market price. Until a few years ago large quantities of crude synthetic camphor had been imported into this country for the making of celluloid, because it was possible to import it with little or no duty.

THE SYNTHESCOPE AND ITS APPLICATION IN THE DETECTION OF ALBUMIN IN URINE.

G. H. MEEKER, PHAR. D., LL. D.



It frequently happens that when a liquid to be tested chemically is brought in contact with a liquid reagent, a peculiar appearance can be seen at the plane of contact between the two liquids. Many chemic tests are so conducted. In general, two methods have been employed for floating the one liquid upon the other, viz., by pouring one liquid down the side of the inclined test tube; and by pouring one liquid through a small funnel tube. In the former of these two methods, a definite plane of contact cannot be produced, while in the latter the production of a definite plane of contact necessitates a special funnel tube with stem of very fine bore.

The synthescope (from *syn*, together; *thesis*, place; and *skopeo*, to see—in other words an instrument for observing the visible effect of placing two liquids in contact) is a simple piece of apparatus for enabling one to make all contact tests withe ease and certainty. The size here described is designed for use with the 6″ x ¾″ test tube. The illustration shows the instrument in use. The test tube originally contained the heavier of the two liquids and a white precipitate has been formed at the plane of contact.

Referring to the figure, AH is the synthescope. It is made entirely of glass ½ mm. in thickness. The length from A to H is 215 mm. and from A to C is 115 mm. The outside diameter at C is 9 mm. and at D is 15 mm. The opaque black background is made of glass and covers ⅓ of the portion CH of the synthescope. The curved lower end of the synthescope is terminated by a minute orifice, the diameter of which must not exceed ½ mm. This is very important, for if the aperture at H be too large, the instrument cannot give satisfactory results.

The synthescope is used as follows: A small volume of the heavier liquid is placed in the test tube and then heated if so desired. A small volume of the other liquid, hot or cold, is now taken up in the synthescope, using the synthescope as though it were a pipette and taking care not to have a longer column of liquid in the synthescope than is in the test tube. The synthescope and its contents are next plunged to the bottom of the test tube. The finger is now removed from A. This allows the liquid in the test tube to flow into the synthescope and to form a true contact plane. In cases where a true contact plane is important, as in the contact test with nitric acid for albumin in urine, the test should be set aside about five minutes to permit faint reactions to become apparent. In cases where a slight admixture of the two liquids is desired rather than

a true contact plane, a regulated sidewise shaking of the apparatus will give the result. The partial black background permits faint clouds to be observed with facility—the observer being enabled to note the appearance by reflected light against a white background, by reflected light against a black background, by transmitted light, or partially by reflected light and partially by transmitted light according to the procedure which best fits the special test in hand.

THE DETECTION OF ALBUMIN IN URINE.

While the synthescope was designed to be used in any contact test, it finds its most frequent application by the clinician in the detection of albumin in urine. We believe that no test for albumin in urine is so readily conducted or so reliable as Hellêr's test carried out by the use of the synthescope. This test is conducted as follows:

Pour strong nitric acid into a 6″ x ¾″ test tube to the depth of about ¾″. Heat the test tube and its contents until the temperature has risen to about fifty (50) degrees Centigrade. No thermometer is needed. Hold the lower end of the test tube in the closed hand occasionally during the heating, and when the temperature becomes as high as it can be without causing discomfort, cease heating. Dip the curved end of the synthescope beneath the surface of the urine to be tested. Be sure that the urine is *perfectly clear*. If the urine be turbid, it must be clarified by filtration before attempting to detect albumin by any method. As soon as the clear urine has risen in the synthescope to the height of about ½″, place the finger over the upper end of the synthescope; remove the synthescope and its contents from the urine; and plunge the same to the bottom of the test tube containing the warm nitric acid. Now release the synthescope and the nitric acid will run into it, lifting the urine and forming a *sharp line of demarcation* between the urine and the strong acid. Unless the hole in the curved end of the synthescope is very small it will not operate properly. Watch that portion of the urine which is in contact with the nitric acid. If albumin be present, a white cloud will be seen either immediately or within five minutes—according to the amount of albumin in the urine. The cloud can be observed by transmitted light alone; by reflected light alone; or partially by transmitted, and partially by reflected light—according to the relative positions of the source of light, the eye and the apparatus. In this way very faint clouds may be detected.

The cloud given in the above manner, by albumin, shows no granular character—and when once studied carefully, is easily recognized thereafter. Occasionally one finds urine so rich in urates or urea that clouds are formed thereby. Such clouds are granular to the unaided eye; and may be prevented by diluting the urine with its own volume of water before making the test for albumin.

It may be remarked that Heller's test when conducted by pouring urine or nitric acid down the inclined side of a test tube is fallacious. This fallacy arises mainly from the fact that many urines contain enough mucin to give a cloud when the test is so conducted. Mucin can give a cloud only with *dilute* nitric acid and dilute nitric acid must always occur when a true contact plane is not produced. A true contact plane cannot be produced except by instrumental aid, and this aid is furnished with certainty and ease when the synthescope is employed.

THE MICROBURETTE.

G. H. MEEKER, PH. D., LL. D.

The toxicologist in making titrations upon minute quantities of poisons recovered from cadavers, and the clinician in titering small portions of materials like blood, etc., taken from patients, are often compelled to work upon samples so small that ordinary burettes will not serve the purpose. The microburette, herein described, was designed and is used by me for the above purposes and for microchemical titrations in general.

Reference to Fig. 1 will show the general character of the apparatus, while Fig. 2 shows a detail of the peculiar cock employed. The dimensions and specifications are as follows:

Length over all	AI,	325	mm.
Length of graduated portion	OP,	225	"
" " portion	DEI,	65	"
" " socket	DEH,	28	"
" " taper	JM,	20	"
" " plane face	KL,	16	"
Width of plane face	KL,	3	"
" at lugs	DE,	26	"
" at lugs	BC,	16	"
Inside diameter at	O,	2.3	"
Outside " "	O,	7	"
" " "	Q,	9	"
" " "	G,	7	"
" " "	H,	5	"
" " "	J,	6.5	"
" " "	M,	5	"
Diameter of outlet at	F,	1	"
Distance between graduation units (.01 cc.) about		2.3	"

Made entirely of glass.
Glass in graduated portion has white background.
Black register mark at N to show position of longitudinal central line of plane face, KL.
Made in two portions, AM and DEI.

Fig. 1.

The two portions are first fitted together by an accurately smooth-ground, tapered joint as shown in drawing, after which a plane face is ground off at KL. While grinding this face, test frequently the flow of water from AM, out of M, past the face KL and out of orifice F. When the rate of flow is about .01 cc. per second, cease grinding and polish face KL.

The apparatus is tubular with the exception of the portion HI, which is a glass rod.

Glass must be perfectly smooth throughout, showing no irregularities like sand marks, blowholes or grinding marks.

Total volume graduated 1 cc., divided into 100 parts.

HOW TO USE THE MICROBURETTE.

The liquid to be titred, usually one cubic centimeter or less in volume, is contained in a small glass evaporating dish, in a watch glass or in a small porcelain crucible—accordingly as best suits the end point tint in the particular analysis in

hand. The microburette having been thoroughly cleansed in the usual way, is next thoroughly cleansed with alcohol, ether, alcohol and water to remove any grease—special attention being paid in this respect to the portion DEI. The two parts are now joined and are held together by a small rubber band which engages the lugs, B, C, D and E, and maintains a moderate tension upon the two parts. No burette stand or clamp is employed. The microburette is held in the hand. HI is used as the stirring rod while titering. A finger, by pressure against lug D or lug E, rotates DEI and in this manner starts or stops the flow of standard solution. When F is not in apposition with KL there is no flow. The flow is established when F and KL are in apposition, which is known by looking at F and at the register mark N. The flow is from M, past KL, out of F and down the outside of the stirrer HI. This flow is satisfactory only when the stirrer has been properly cleansed as described above. In filling the apparatus prior to a titration, use a minute funnel at A. Fill nearly to A and then establish the flow until the level sinks to zero. The stirrer is now coated with a very thin film of standard solution and the titration should be begun at once.

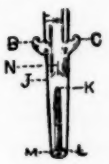


Fig. 2.

While the microburette will commend itself for its convenience and elegance in use, its main advantage arises from the fact that its flow is partly controlled by capillary action on the outer surface of the portion FI. This feature enables one to deliver small fractions of a drop from the microburette with as much ease as whole drops can be delivered from the ordinary burette. The readings are to 1/200 cc.

In calibrating the microburette and in running test titrations, the assay balance should be employed.

THE ASSAY PROCESSES OF THE U. S. P.

A. R. L. DOHME AND H. ENGELHARDT.

On various occasions we have pointed out that several assay processes of the present U. S. P. are very much in need of being thoroughly revised, both because the methods are rather cumbersome, and the results are far from giving the true percentage of the active principle. Since the methods are to be thoroughly discussed at this meeting we thought it necessary to again give our views in regard to the processes, although several points given here may have been discussed by us on previous occasions.

We still believe that the aliquot part method, when worked with precaution, gives more accurate results than the percolation method. The drug is more thoroughly exhausted by shaking with the menstruum than by percolating. A percolator perhaps is our most unscientific piece of apparatus. A channel might be formed in the packed drug, the parts adjoining this channel may be exhausted, while other parts of the drug come in contact with the menstruum only superficially. The method, besides, is very tedious, especially when such a fine powder

(No. 60) as prescribed by the U. S. P. is employed, and also requires a larger amount of menstrumm for the exhaustion.

We, therefore, strongly recommend the adoption of the aliquot part method, having proven by numerous experiments that results by this method compare favorably with those obtained by exhausting the drug completely by percolation.

For the final shaking out of the alkaloids, we recommend to use whenever possible, simple menstrua, viz., ether or chloroform and not mixtures of both in various proportions. As a rule, simple menstrua are less liable to produce emulsions than mixtures, and the mentsrua are more easily recovered for future use than mixtures, which always require tiresome adjusting.

For the extraction of the drugs, however, a mixture of ether-chloroform is to be preferred. Such a mixture seems to penetrate the cell-walls better than a simple menstruum, and consequently to extract the alkaloids more thoroughly. It is also recommended to allow the drug to stand with the menstruum for at least one-quarter hour before adding the ammonia, as the results obtained by doing so are somewhat higher, in our opinion, than those obtained by adding ether-chloroform and ammonia to the drug at once.

Whenever possible the alkaloids should be estimated by titration; in some cases when hydrolysis is liable to take place as in aconite, coca leaves, etc., a check by gravimetric estimation might be of advantage.

Of all the indicators for alkaloids, we have found cochineal to be the best, since only in titrating the alkaloids of ipecac is any difficulty experienced with this indicator. Iodeosin. at present used in the U .S. P. is rather unreliable, since the aqueous liquid is not always colored red when the end point is reached, but at times a red scum is formed at the contact of the two layers, the color of this scum increasing in intensity with the addition of the alkali. It is difficult to judge, in case this happens, when the end point is reached.

In regard to the various drugs and the galenical preparations thereof, we beg to offer the following suggestions:

Aconite Root.—To avoid hydrolysis as much as possible, ammonia might be replaced by sodium carbonate or bicarbonate solution. The present process is very tiresome, only in the case of a larger dilution can a somewhat rapid filtration be effected. Keller's aliquot part process, using ether-chloroform and sodium bicarbonate for extracting the drug, and ether alone for the final extraction of the alkaloid, after having made the acid solution alkaline with sodium bicarbonate, gives very good results. The wording, "not less than 0.5 per cent of aconitine" should be replaced by "not less than 0.5 per cent of ether soluble alkaloids," since the residue, although it consists for the greatest part of true aconitine, is always contaminated with other basic substances. The Squibb's test has been found to be too much dependent on individuality.

Extract of Aconite.—No matter how carefully this extract is prepared, a deterioration of the alkaloids is liable to take place, and the physiological strength consequently is largely reduced. Extract aconite should never be prepared. In assaying extract of aconite, the following simple process gives fairly accurate results: Dissolve the extract (2 grams) in 10 cc. of dilute alcohol, transfer the solution to a separator, make alkaline with sodium bicarbonate solution and shake

out with several portions of ether. From the ethereal solution the alkaloids are extracted by shaking with several portions of acidulated water, and from the latter, after making alkaline with sodium bicarbonate, the alkaloids are removed by shaking with several portions of ether. From ethereal solutions, after filtering to remove any suspended bicarbonate, the ether is distilled off, etc.

Fluidextract of Aconite.—Ten cc. are transferred to a separator, made alkaline with sodium bicarbonate, and then assayed as just given.

Tincture of Aconite.—One hundred cc. of the tincture are evaporated at a temperature not exceeding 60° C., the residue taken up in 10 cc. of dilute alcohol, and this solution assayed as given under extract.

Solution of Hydrogen Dioxide.—The method for determining the acidity should be revised. By evaporating 25 cc. of hydrogen peroxide solution to 10 cc. in the presence of 5 cc. of N/10 potassium hydroxide solution, not all the hydrogen peroxide is destroyed. This can be effected only by evaporating the solution in a platinum dish or by adding a suitable catalyzer, such as platinum black, etc.

Asafetida.—Owing to the scarcity of this article, it would be advisable to decrease the percentage of alcohol soluble matter, and to increase the allowable percentage of ash.

Aspidium.—The activity of this drug depends almost entirely on those substances present in what is generally termed "crude filicin". A reliable method has been worked out for determining crude filicin. The microscopic requirements given in the present U. S. P. will be met by a physiologically inactive drug also.

Belladonna Root and Leaves.—The assay process adopted for the new U. S. P., viz., the aliquot part method, has a decided advantage over the present process, and gives very satisfactory results.

Fluidextract and Extract of Belladonna.—The assay processes for these preparations are satisfactory. It is, however, advisable to increase the amounts of both the immiscible solvents, and the acidulated water.

Cantharis and Its Preparations.—These should be assayed; several reliable methods have recently been published. A suitable menstruum for preparing the mixture should also be looked for, as by the present menstruum only about 50 per cent of the cantharidin is extrated from the drug when used in the proportion 1:1.

Capsicum.—We have met with several specimen of inferior capsicum. Why not give and estimate the percentage of oleoresin?

Cinchona.—For the U. S. P. IX, unfortunately, an assay process has been proposed, which is similar to the one now official, differing from it only by the larger amount of menstruum taken for extracting the alkaloids from the drug. Although this is a step in the right direction, we doubt very much whether the increased quantity of menstruum will hold in solution the alkaloids from high-grade drugs. The Fromme process depending on the breaking up of the cells by the use of hydrochloric acid has always given us satisfactory results. It is a short one, and a determination can easily be carried out in two hours. That such a process is of great importance to chemists who have to make a dozen or more cinchona assays at the same time (as in our laboratory, when numerous samples for purchasing the drug are submitted) is obvious. We wish to mention again

that the alkaloidal residue should be dried at a temperature not exceeding 60° to 70° C., as otherwise it is strongly discolored. Any traces of chloroform should be driven off by treating the residue twice or three times with ether. In our laboratory, we invariably control the gravimetric results by titration, because the alkaloidal residue very frequently includes waxy and other substances which naturally increase the weight. The titration when carried out strictly according to Panchaud's direction, is not at all difficult.

Coca.—Here also the percolation process should be abandoned in the assay method. Keller's method, using plain ether, gives very satisfactory results. In case emulsions occur, which frequently takes place on account of the large amount of mucilaginous matter in the drug, tragacanth should be used for breaking up the emulsions.

Cochineal.—It is advisable to include in the U. S. P. a determination of the color strength of the drug, also an estimation of the moisture.

Colchicum Seed and Corm.—We have pointed out on various occasions that the results obtained by the present assay methods are absolutely wrong, that the residue calculated as colchicine contains only about 50 per cent of the alkaloid. The assay processes should be thoroughly revised. Dr. Lyons has given valuable information in what way these processes could be improved. For the estimation of pure colchicine in the alkaloidal residue, several methods are available also. We do not care to go into details about these improvements since we have given a compilation of them some time ago.

Conium Seed.—The assay method for this drug also should be revised. It is very cumbersome and could easily be replaced by a more expeditious process.

Conium Leaves.—This drug, although not official, should never be used. All the samples submitted to this laboratory for examination were almost void of Coniine.

Cubebs.—An estimation of and requirements for the percentage of oleoresin should be given. Cubebs vary considerably in the amount of oleoresin.

Belladonna Plaster.—A few slight modifications of this assay process, which work very well, have recently been recommended.

Ergot.—On various occasions we have mentioned a simple process to estimate the approximate amount of cornutine present in the drug. If it can be proven beyond doubt that the percentage of cornutine is in proportion to the physiological activity, this test should be adopted for the U. S. P.

Ferrum Reductum.—The assay process could be improved on.

Gelsemium and Its Preparations.—Assay processes for these substances have been recommended on various occasions. We believe, however, that such a process is only of relative value as long as the proportion of the active substance to the inactive is not known in the residue determined as total alkaloids. Quite recently a good deal of light has been thrown on the constituents of gelsemium and possibly in the near future an assay process based on the estimation of the active principle alone will be worked out.

Glandulae Suprarenales et Thyroidae.—Colorimetric estimation of the active principles is desirable.

Granatum.—The total alkaloids in pomegranate bark can easily be estimated.

Guarana and Its Preparations.—The assay processes are good.

Hydrastis and Its Preparations.—The amount of golden seal taken for the assay is entirely too large, considering the high percentage of hydrastine in the drug. There is no reason why the assay of the fluidextract should not be based on the same principle as the assay of the drug.

Hyoscyamus and Its Preparations.—All that is said about Belladonna applies to these products also.

Ipecacuanha and Its Preparations.—The amount of drug prescribed for the assay process should be reduced considerably, say to about 6 grams. The assay process otherwise is satisfactory. We have pointed out above that the titration of the alkaloidal residue is somewhat difficult, and it would be desirable to try other indicators which might prove to be more satisfactory.

Jalap.—A shorter process depending on the exhaustion of the root with hot alcohol and taking, after cooling and readjusting the weight, an aliquot part has been recommended by us on a former occasion. In connection with this drug it may be said that the quality of the various samples and shipments during the last twelve months was superior to that in previous years. Would it not be advisable to control the galenical preparations of jalap by simple assay processes?

Kola and Its Preparations.—These should be assayed by a process similar to that given for guarana. To estimate the amount of theobromine, acid instead of water has to be used for extracting the alkaloids from the chloroformic solution.

Malt and Extract of Malt.—It is advisable to give assay processes for the determination of maltose and diastatic power. We have met with numerous samples of malt which were deficient in both respects.

Nux Vomica and Its Preparations.—Keller's aliquot part method, using ether and chloroform, gives fairly good results; it must, however, be admitted that the results obtained by using the U. S. P. menstruum are slightly higher. The amount of the powdered drug can be reduced on account of the high percentage of alkaloids in the drug. It is to be regretted that the U. S. P. IX again shall adopt a method for determining the strychnine. The present official method and the numerous modifications thereof give fairly accurate results only in the hand of experienced workers. We doubt very much that the variation of the proportion of strychnine and brucine in the drug is greater than the variation obtained by assaying the same drug by various chemists. Only such methods should be adopted in the U. S. P. which are simple and give fairly accurate results, and not such ones which require much ability and experience. The U. S. P. is not written for experienced chemists, such as are generally found in the laboratories of the large wholesale houses, but for the retail pharmacist also who very seldom has and will have a thorough experience in assaying drugs. We have mentioned on other occasions that of all the pharmacopœias only the English directs the strychnine to be estimated, and this is done by a method which is still inferior to the old Gerock method and its modifications. We are afraid that by adopting the strychnine determination much trouble and numerous litigations will be caused. If it is important to determine the strychnine alone, why has not a process for

doing so been adopted by the Swiss, German, etc., pharmacopœias, which without doubt are up-to-date works? Is brucine therapeutically absolutely inert, and can it be entirely neglected? In our opinion, the determination of the total alkaloids (which by no means is such a very simple one, on account of the ammonia bases and the soap which are liable to be formed during the assay process) is a better criterion for the quality of the drug than an unreliable and incorrect estimation of the strychnine alone.

Extract of Nux Vomica.—The easiest way of assaying this extract is to convert the extract into a fluidextract by dissolving in diluted alcohol, rendering the solution alkaline with ammonia water, shaking out with several portions of chloroform, etc.

Fluidextract and Tincture of Nux Vomica.—Evaporate the quantity prescribed for the assay to dryness, take up residue in dilute alcohol and proceed as just given.

Opium.—In regard to this drug, we wish to refer to an article submitted to the A. Ph. A. (Proc. A. Ph. A., 1910, page 829) a year ago. There is no doubt that by the present official process almost the entire morphine contained in the drug is obtained, although Delbourdeaux, Journ. de pharm. et chem. VII, IV, 68, claims that by further exhaustion with water still more morphine can be extracted. He also claims that if the crude morphine, as obtained by the U. S. P. process, is not washed thoroughly, lime-water soluble substances are determined as morphine, rendering the percentage of the latter too high. We have obtained very good results with the present method, we think, however, that a shortening of the process would be desirable.

Extract and Tincture of Opium.—The assay methods work satisfactorily.

Pancreatin.—For the assay process the use of potato starch should be recommended. The milk test is unreliable and should be deleted.

Pepsin.—We have at times experienced considerable trouble with the assay process, which apparently was due to the age of the eggs. Recently we have only used eggs five to ten days old, and have obtained with such material rather concordant results. At the Indianapolis meeting of the Am. Chem Soc., a paper will be read dealing with the use of dry egg albumin in the assay process of Pepsin. If the results obtained by using dry albumin are encouraging, this modification should certainly be tried by the Revision Committee. Dry albumin can more easily be obtained in a uniform quality than fresh albumin, which contains a varying amount of water, according to the age of the eggs.

Physostigma and Its Preparations.—Slight modifications as to the quantities of immiscible solvent and acidulated water should be made.

Extract of Physostigma.—The use of sand and evaporation to dryness is to be avoided. We prefer to use powdered glass and to evaporate the liquid until the alcohol is expelled. Such a moist mass can be transferred to a bottle much easier than the hard mass obtained by the official process. Results just as accurate can be obtained by converting the solid extract into a fluidextract by dissolving it in dilute alcohol, rendering alkaline with sodium bicarbonate shaking out with ether, etc.

Fluidextract and Tincture of Physostigama.—The modifications just mentioned apply to the assay of these preparations also.

Pilocarpus and Its Preparations—.Replace the percolation process in the assay method by the aliquot part method. In case emulsions should be formed, use tragacanth for breaking up.

Fluidextract and Extract of Pilocarpus.—The modifications suggested under physostigma apply to the assay processes of these preparations also. Fluidextract of pilocarpus can be assayed by shaking out directly with chloroform after making alkaline with ammonia. Emulsions which are liable to be formed can be avoided by using a large amount of chloroform.

Piper.—The percentage of oleoresin should be determined.

Podophyllum.—Podophyllum with less than 4 or 4.5 per cent of resin is frequently met with on the market. An assay process for this drug therefore seems necessary.

Fluidextract of Podophyllum.—The percentage of resin should be determined.

Sanguinaria.—An estimation of the total alkaloids of blood-root might be valuable, although such a determination possibly does not indicate the therapeutic value of the drug.

Scopola and Its Preparations.—All that is said in regard to belladonna applies to this drug also.

Sinapis.—An estimation of allylthiocarbamide can be recommended.

Stramonium and Its Preparations.—See modifications recommended under belladonna.

Strophanthus.—There is no reason why this potent drug should not be assayed. A reliable process has been worked out.

Veratrum.—An estimation of the total alkaloids has been recommended on various occasions.

In conclusion we wish to say again that we hope that in the U. S. P. IX such assay methods will be adopted as are easily carried out, with the simplest apparatus, and in as short a time as possible, which, however, give at the same time reliable results, not theoretically accurate but practically accurate.

DISCUSSION.

Prof H. M. Gordin thought that since both the percolation method and the method of aliquot parts had merits and demerits, it was advisable to combine them so as to produce a method containing the merits of both.

Prof. L. D. Havenhill was doubtful as to the possibility of combining both processes. He agreed that percolation was the most uncertain process and would like to see it banished from pharmacopœial assays. In the hands of the average pharmacist he believed the aliquot part method would yield the better results.

Mr. F. R. Eldred agreed that the percolation method required the most careful manipulation, and for that reason would expect that novices would obtain better results by the aliquot method than by percolation; on the other hand, he thought that when the assayers were properly skilled better results could be obtained by percolation. He did not believe that the analytical objection of channeling would apply to this form of percolation as it did to the percolation of drugs on a larger scale. In his experience he had never had any trouble in exhausting the drug, though it is necessary to be sufficiently skillful to know when extraction is complete.

Mr. L. E. Warren agreed with the statement of Mr. Eldred. He had never found any difficulty in percolation of a drug or in determining when a drug had been exhausted.

Mr. C. E. Vanderkleed said that in his extended experience the aliquot part method had proved to be satisfactory, and he could not see any profit in trying to improve upon something that was giving entire satisfaction. The aliquot method had the great advantage of consuming less time than the percolation method, though with certain menstruua there is a possibility of error, as for example, in the extraction of cinchona bark, where in 5 volumes of water and 5 volumes of alcohol in 100 cc. one-half of the extracting liquid would not necessarily be represented by 50 cc., but probably by less than 50.

Dr. George F. Payne was strongly in favor of the aliquot part method, because the saving of time and convenience of handling the work was considerable, and he had used it almost exclusively in making a large number of assays in state work. It had the additional advantage in providing the analyst with a reserve portion of liquid in case of the loss of the first portion taken because of a broken flask or beaker, etc.

Dr. J. M. Francis and Prof. C. H. LaWall also expressed their preference for the method of aliquot parts.

Prof. Charles E. Caspari said that he was also in favor of the aliquot method, but not for the reason expressed by Dr. Payne. He did not believe it wise to infer that a remaining portion of the liquid represented exactly the first portion taken, since in the majority of cases after the operator has used the first portion he fails to take proper care of that remaining. As a concrete example he cited the assay of Nux Vomica, where it was difficult to pour off the first portion without stirring up the solid matter in the bottom of the flask. If the first determination is lost it would be necessary, or at least advisable, to percolate or filter the remainder and to use a still smaller aliquot portion, and he did not believe that in such cases the remaining portion could be relied upon to give a fair basis for comparison.

Prof. A. B. Stevens said that in drug assay work we must not expect such exact results as in the assay of inorganic salts, like those of silver. In the use of aliquot parts there is a little loss by evaporation while measuring the aliquot part, but the error is slight and not so important as that the method should give uniform results. The principal object in proximate assay work is to exclude drugs of inferior quality. In most cases the Pharmacopœia requires that drugs and preparations shall not be below a certain specified strength, but do not exclude those of higher alkaloidal content.

In reply to a question by Dr. Francis, he stated that if he were allowed but one indicator for all purposes he certainly would prefer cochineal.

Prof. E. V. Howell mentioned a plant which in his section was known as "Blue Bottle," "Baby's Breath" and "Cow's Breath," the tincture of which was very sensitive to acids and alkalies. One drop of a centinormal solution of alkali would change it from red to green; or one drop of a centinormal solution of acid, from green to red. He used the flowers but the stems were also available. He mentioned it with the hope that some one doing a good deal of analytical work would try it out as an indicator.

Prof. A. B. Stevens said that the principal objections made to the U. S. P. method for the assay of Aconite were the difficulty of filtration and length of time required for evaporation, both points of which are very easily overcome. He had assayed aconite obtained from many sources and had no trouble whatever in filtration where he followed the method published by him some years ago of adding about 10 gm. of pumice stone. In evaporation all that is necessary is to drive off the alcohol, which materially reduces the time required. In a number of experiments he had not found that a somewhat higher temperature had an injurious effect upon the active constituent and believed that a long, slow evaporation was more injurious than rapid evaporation at a higher temperature.

When ammonia was added to aconite, ether or chloroform would not exhaust the drug using the complete extraction method by percolation. He had tried various mixtures of ether, chloroform and alcohol; alcohol and ammonia, and alcohol 70 parts to water 30 parts. He had formerly thought that alcohol was a better solvent than a mixture of alcohol and water, but after experimenting had found that a mixture of 70 parts alcohol and 30 parts water was really better.

In a number of experiments tried on the same sample of aconite, with chloroform and ether, and ether alone, and the pharmacopœial mixture without ammonia and with ammonia, he had found that invariably the present solvent gives the best results. For illustration, the residue

from the pharmacopœial assay was physiologically active when dissolved in water in the proportion of 1 part aconite to 1400 of solution, while the residue from the ether-ammonia assay was not active in solutions greater than 1 to 1200.

Prof. Charles E. Caspari referred to a recent paper on Pepsin Assay, and stated that two different investigators had apparently proved that pepsin exerted its greatest action on egg albumen when the egg was about eight days old, after which the activity decreased until about the twentieth or twenty-first day.

Prof. Virgil Coblents referred to the employment of dried albumin in testing pepsin, and said that physiologists had generally adopted dried blood fibrin for this purpose. It possesses the advantage of uniformity, can be reduced to powder of any degree of fineness, and dried to any degree desired. After testing with pepsin the undigested excess can be removed, washed and dried, thus placing the testing of pepsin on a more nearly quantitative basis.

STANDARIZATION OF SOLUTIONS FOR ALKALOIDAL ASSAY.

A. B. STEVENS AND A. F. SCHLICTING.

It occurred to one of us that some of the variations in results obtained by chemists when assaying the same sample of drug, might be due to different standards used in preparing their standard solutions, possibly also to the indicator used. This suggested that it might be interesting and instructive to determine to what extent these factors affect the results, when conducting experiments under exactly the same conditions as to temperature, apparatus, etc.

A quantity of solution of potassium hydroxide was prepared, as nearly N/50 as convenient. The exact factor was then determined by means of the various standards used by chemists in drug assay. In testing these standards phenolphthalein was used as an indicator. The results are given in factors for the potassium hydroxide.

Standard	Potassium Bitartrate	Oxalic Acid	Succinic Acid	Sulphuric Acid	Hydrochloric Acid
KOH Factors	1.0561	1.0648	1.0638	1.0035	1.124
	1.0613	1.0627	1.0683	1.0057	1.112
	1.0629	1.0625	1.0706	1.0083	1.113
	1.0584	1.0611	1.0661	1.0972	
	1.0571	1.0618	1.0661	1.1006	
Average	1.0592	1.0625	1.0669	1.0962	1.118

Bear in mind that these results simply show the relation of one standard to another, or the variation between standards used.

Oxalic acid is preferred by some but has fallen into disrepute because it contains water of crystallization, a portion of which might be lost during drying, to free it from adhering moisture. Succinic acid is free from water of crystallization, hence can be dried without loss. The principal objection that can be raised to any of these for alkaloidal assays, is the fact that one indicator must be used in the standarization of the alkali, and another in the actual assay. It is proposed to overcome this objection by the use of pure anhydrous morphine as a standard. Morphine does not readily give up its water of crystallization. It requires a tem-

perature of about 110 degrees C. for several hours, and this darkens the morphine. It is also possible that some of the morphine has been decomposed. We prefer to use crystallized morphine, freed from adhering moisture by placing the powdered morphine in a desiccator for a few hours. A sample of crystallized morphine kept in a vacuum desiccator for twenty-four hours failed to lose weight, while a sample of oxalic acid kept in the desiccator for the same length of time lost nearly all of its water of crystalization.

A given weight of dried crystalline morphine was dissolved in a definite volume of standard sulphuric acid, and the acid actually combined with the morphine determined. From these results the acid factor was calculated. The average from several determinations was 1.0035 with cochineal, and 1.004 with methyl red. Compare these results with those for sulphuric acid under indicators. While we prefer morphine as a standard for alkaloidal assay, we feel that it has not sufficient advantage over potassium bitartrate to warrant a change from our present official standard.

INDICATORS.

Experiments were made to determine the variation in the results due to the use of different indicators. In the first series of experiments the potassium hydroxide solution was standardized by potassium bitartrate. In the second series by oxalic acid, and in the third series by succinic acid.

SULPHURIC ACID FACTORS.

	Phenolphthalein	Hæmatoxylon	Cochineal	Methyl Red	Iodoeosin
			FIRST SERIES.		
	1.0014	0.9904	0.9808	0.9793	0.9798
	1.0064	0.9906	0.9798	0.9800	0.9766
	0.9999	0.9925	0.9802	0.9793	0.9766
Average	1.0025	0.9912	0.9803	0.9795	0.9777
			SECOND SERIES		
	1.0045	0.9934	0.9839	0.9824	0.9826
	1.0096	0.9941	0.9826	0.9829	0.9796
	1.0039	0.9955	0.9832	0.9824	0.9796
Average	1.0057	0.9943	0.9832	0.9826	0.9806
			THIRD SERIES.		
	1.0079	0.9968	0.9872	0.9857	0.9861
	1.0130	0.9974	0.9861	0.9862	0.9828
	1.0064	0.9989	0.9863	0.9857	0.9828
Average	1.0091	0.9977	0.9865	0.9859	0.9839
Sulphuric acid factor obtained by use of morphine.					
		1.0164	1.0015	1.0015	
		1.0190	1.0029	1.0015	
	Average	1.0177	1.0022	1.0015	

After a careful study of these results we recommend the use of crystalline morphine as the standard for alkaloidal assay because it may be readily obtained pure,, of definite composition, and also because the same indicator may be used throughout. Next to morphine we prefer succinic acid because it is free from water of crystallization, dissolves readily and is easily titrated. Potassium bitartrate is preferable to sulphuric acid or hydrochloic acid, because it is more easily

prepared, is always ready for use, and is equally, if not more acurate. In any case a definite standard should be stated and adhered to.

When possible, the same indicator should be used throughout. If this cannot be done then use the same indicator for standardizing the acid that is to be used in determining the excess of acid.

ALIQUOT PARTS.

The statement has been frequently made that the use of aliquot parts, in the hands of experts, gives results which compare favorably with those obtained by the complete extraction method, but that this would not be true in the hands of less experienced chemists. The writer has never seen or heard of an attempt to prove this statement. He therefore selected six students, none of whom had more than a short course in drug assay work. One of them had not made more than a half dozen drug assays and had not even received instructions in assay work. They were given directions for the assay of scopola and cinchona by both methods and without further instructions than that they were to make duplicate assays as carefully as possible. They were not told the object of the assays. The results obtained are as follows:

SCOPOLA.		CINCHONA	
Aliquot Method	Percolation Method	Aliquot Method	Percolation Method
0.31	0.35	5.57	5.88
0.31	0.35	5.725	5.93
0.263	0.27	5.242	5.73
0.258	0.285	5.068	5.328
0.263	0.289	6.02	7.03
0.283	0.299	5.785	6.013
0.336	0.304	4.955	5.236
0.336	0.305	5.03	5.464
0.29	0.230	5.555	5.692
0.278	0.263	5.576	
0.310	0.294		
0.272	0.284		
Maximum ... 0.336	0.350	6.02	7.03
Minimum ... 0.263	0.238	4.955	5.236
Difference .. 0.073	0.112	1.065	1.794

DISCUSSION.

PROF. STEVENS: "The last page contains some figures which show the variation in results obtained by inexperienced workers when using aliquot parts and the complete extraction method. In addition I will place upon the board some results taken from Dr. Kebler's report on "The Status of Drug Assaying." A. Ph. A. Proceedings, Vol. 58. On page 858 we find the per cent. of variation in results obtained by different workers when using both methods, as follows:

Aconite Root.	Total extraction.....	20%	Aliquot parts....	25%
Belladonna Leaves.	" "	20%	" "	10%
" Root.	" "	15%	" "	5%
On pages 869, 871, we find:				
Aconite Leaves.	Total extraction.....	51.7%	Aliquot parts....	14.8%
" Root.	" "	38.1%	" "	48.3%
Belladonna Leaves.	" "	38.6%	" "	16.4%
" Root.	" "	28.0%	" "	9.8%
Cinchona Yellow. (Total alkaloids)	" "	21.6%	" "	11.1%
" Red.	" "	14.5%	" "	11.3%
Coca.	" "	46.5%	" "	54.4%

"These results from Dr. Kebler's report are especially interesting when compared with those presented in the paper, as the former may be said to represent the work of trained chemists, while the latter represents the work of inexperienced chemists. With both classes of operators we find that in the majority of cases the variation in results are less when aliquot parts are used. However, with equal care, I believe that the difference rbetween the two methods is not very great, so that if either method is used in the next revision of the Pharmacopœia there will be but little ground for criticism.

"The causes for error when using aliquot parts are: First, inaccuracy in measuring, and second, loss by evaporation when pouring the volatile solvent on the drug and again when measuring the aliquot part. To reduce this to a minimum the solvent should be cooled before measuring, and again reduced to the same temperature before measuring the aliquot part. It appears, however, that the error due to these causes is no greater than the error due to imperfect extraction, when using the total extraction method. Different results are frequently obtained by different operators when using the potassium mercuric iodide test to ascertain if the drug is exhausted."

THE PLACE OF THE JOBBER.

Of course, in the last analysis, the existence of the jobber depends, as it does with all others, upon his proving himself worthy of his hire. In business no men or methods can survive in a struggle with other men and other methods that do the work more cheaply and efficiently.

As long as a territory is sparsely settled its business does not justify manufacturers in sending out their own salesmen. The trade is handled by wholesalers. As soon as the territory becomes populous and prosperous, the manufacturer naturally begins to consider whether or not it is more to his advantage to deal direct with the retailer or through the medium of a jobber. This sort of situation is continually recurring, and the manufacturer's decision is made in terms of *cheapness* and *efficiency* of *service,* whether he advertises or not. In a situation like this, if the wholesaler cannot prove himself worthy of his hire, he loses his customers.

The manufacturer who wants to do away with the wholesaler has a man's job in front of him. Suppose, for example, he decides to do away with jobbers in the Middle West. The first thing he can count on is a loss of anywhere from 10 to 50 per cent of the trade—no very alluring prospect. Next, he must take upon himself the expense of a big selling force, of a vastly complicated shipping problem, of new storage warehouse facilities, of much increased bookkeeping and credit departments, and he must accept in the place of three or four large ledger accounts, which are as good as gold, several thousand petty accounts in which the risk of loss is problematical. Furthermore, he must induce the retailers to accept all the troublesome complications which come from buying from many concerns instead of from one.—*McPike's Bi-Monthly.*

Section on Education and Legislation

Papers Presented at the Fifty-Ninth Convention

REPORT OF THE COMMITTEE ON NATIONAL LEGISLATION.

(LEGISLATIVE YEAR 1910-1911.)

The one act of this Committee, or of its Chairman, that needs to be reported is the part taken by it at a hearing of the so-called Foster Bill, a bill to place the control of narcotic drugs in the hands of the Commissioner of Internal Revenue. The hearing was before the Committee on Ways and Means of the House of Representatives, during the last regular session of Congress.

The details of the two hearings upon this bill have been widely published and the memorial presented by your Chairman is herewith attached.

Probably of more importance and of largely more helpfulness to the Chairman was a careful conference had by him with that very able, most agreeable and much experienced representative of pharmacists, Mr. W. S. Richardson, of the city of Washington, Chairman of the Committee on National Legislation of the National Association of Retail Druggists.

Although your Committee cannot claim the accomplishment, or part in the accomplishment of any matter of direct importance, it is hoped, by the Chairman, that *his* closer contact with legislative affairs and *his* more thorough study of conditions and of the position of this Association, respecting its very catholic membership, will enable him to make suggestions, prompted by his observations, which will claim such thought and consideration as will, finally, lead the Association to further its original and professed objects.

The first and most fundamental recommendation is that we be serious. For the sake of all that is right and true, let us be serious about serious matters and, especially, about legislation. Nothing would seem to be so capable of impressing the Association with the seriousness of this part of its work as a veritable company of ex-chairmen of your Legislative Committee. They know and feel, and they have ably and forcefully shown their knowledge and feelings in their reports; they *must* evince earnestness, if they half-way do their duty. But, what does the Association give in return for this care, this earnestness, this enthusiasm? Sarcely a patient hearing; and the half-hearing ends, mayhap, in a lark! This Chairman is not pleading for himself, neither for his illustrious predecessors, but for the Association that it, through its members, may meet its grave responsibilities in respect to the law, both as to its enactment and its enforcement. We cannot, however, treat a subject seriously that we do not understand and, of course, we cannot understand it without study.

Would you know the power and import of command, of authority, which is law? If so, witness what has followed the very first law. "Let there be light"—Do you know what impress has been made on man and his character by the Decalogue? Whether you be orthodox or not, you respect the broad, elevating, helpful principle involved in the command, "Thou shall love the Lord, thy God,

with all thy heart." Neither will you deny the benefits that follow obedience to the law, "Love thy neighbor as thyself." Undoubtedly, civil and moral laws are the very foundation of social peace and moral development and, because this is so, all that is done with the law must be most seriously done.

If you would know and know well all that you are required to know, fundamentally, of law, as it relates to pharmacy, then study well the report of this same Committee, written by that wise, true and lovable man, Oscar Oldberg, and presented at the Hot Springs Meeting in 1908. It is not yet too late to do justice to that report; it should be used as a text-book in our colleges and should be the foundation for an examination for those seeking places on our boards of pharmacy.

The next recommendation is that this Association study itself to the end, that it may, properly and effectively, take part in this very serious work of promoting, amending or retarding legislation. The observation of your Chairman enables him to tell you that, in striving to carry out your very indefinite instructions, regarding the Foster Bill, at the hearing, he was, as an individual, among other individuals, none seeming to be working for exactly the same end. The divisions of pharmacy, as represented in the membership of this Association, were as numerously represented as there are divisions. Listen to the list: wholesale association, retail association, this mixed body of ours, the government bureau of chemistry. State pharmacy board, local pharmaceutical association, food and drug commission. Individual wholesaler, individual manufacturer, individual manufacturing chemist, individual retailer. A remarkable discordant set, all of whom should have been, in some way, represented by a uniform body. Is it not, in view of this mixup, the business of this Association to study its own character and organization before it goes further into this work? It surely needs to be better and more differently organized, that it may become more thoroughly represenative of pharmacy, as a whole. It is suggested that, at least, a legislative conference be established under its auspices, where, possibly, the differences of the drug trade may be harmonized and where the true and vital interests of all may be conserved; a clearing house for legislative problems and a "backer" for all good legislative paper. This is a serious proposition, seriously presented. Something *must* be done so that even one little man, representing this great Association, shall have much more force, worlds more force than an authenticated individual. Otherwise, the American Pharmaceutical Association must lose prestige as holding legislative influence.

Undoubtedly, the impracticable organization of the Association for present usefulness may be rendered, to a degree, less hurtful by the formation of the suggested legislative conference, a conference sensibly more representative of American pharmacy.

This Association is quite competent to organize and hold together such a conference, which should be made up of, say, five conferees from each national association and one from each of the several state associations, with the Chairman and Secretary of the Section on Education and Legislation, acting as such for the conference. The size of the conference could not be objectionable, since the representatives *present* would constitute a quorum and the absence of representation from any quarter could not be blamed upon the scheme, but must, neces-

sarily, be a fault of the body not represented. Under such arrangements, there could be no just disagreement with the action of the acting conferees.

It is well known that there is not sufficient time offered, during the meetings of the Association, to make it possible to discuss the details of pending and proposed legislation and, for this reason, especially, is it desirable to form some such conference, which could meet at a more central location and take ample time to properly handle all important matter of national legislation. Oldberg truly says, "Only experienced pharmacists, who have given this subject serious and thorough study, can be safely trusted to construct wise, just and effective pharmacy laws." Abundant evidence may be produced to show the failure of those outside of pharmacy to properly meet the requirements of the situation, in this regard. As has been so often and so variously said, "If pharmacists do not present proper and necessary legislation to control and regulate pharmacy, then others, less competent, will offer and promote such legislation."

Let there be no delay in the permanent formation of "The Legislative Conference of the American Pharmaceutical Association." Let it be as large, as active and as effective as its wonderful and sublime possibilities demand. Awaiting its wise treatment and disposal are many important subjects. Among many others are the following pending bills:

First. The amendment of the Pure Food and Drugs Act, whereby better regulation of the vicious nostrum is to be secured. This certainly merits careful consideration and earnest support.

Second. The bill to place control of narcotics in the hands of the Commissioner of Internal Revenue. Certainly, this is a most important and far-reaching piece of legislation, that needs the very best treatment it can have by those so directly interested, from many points of view. Chairman Richardson makes valuable suggestions, when he favors that order of things, which would make the Retail Liquor Dealers License include all charges for handling narcotics by pharmacists. He also thinks a personal bond, by the pharmacist or small dealer, sufficient and that compounds containing but small quantities of alcohol should be exempt from the operations of the proposed law.

Third. The bills to provide a Department of Public Health. In connection with this measure, pharmacy, in certain quarters, has discredited itself in the eyes of wise and benevolent people. This Association should make no such mistake and should openly and earnestly advocate the passage of the bill, not only in the interest of the public weal, but in the interest of pharmacy as well.

Fourth. Patent and trade marks. Though of far less importance, this is still an unfinished subject of legislation, to which our "Legislative Conference" might give many hours of painstaking deliberation.

Fifth. Parcels Post. It may be safely considered whether or not pharmacy, in part or as a whole, should separate itself from all those interests and the great mass of intelligent people, who are so strongly and so generously advocating its introduction. "The lion in the path of progress," is a very unattractive beast and we should not be happy in his company."

No matter how we may feel toward any of these subjects, which, in various forms, are persistently knocking at the doors of Congress, they are national in scope and are therefore, large in importance, claming serious and careful consideration from this Association and its members. They so vitally concern pharmacy and its votaries as to make it imperative that *the very best means we can command or create* should be used in their happy settlement.

H. P. HYNSON, Chairman.

Section on Practical Pharmacy and Dispensing

Papers Presented at the Fifty-Ninth Convention

A NEW COLOR FOR USE IN PHARMACEUTICAL AND TOILET PREPARATIONS.

CHARLES H. LA WALL.

While recently making some experiments with different harmless coloring agents for use in toilet preparations, such as tooth washes, antiseptic solutions, etc., I made use of one which has an extended and increasing employment in food products and confectionery, but which is practically unknown in pharmacy, so far as I have been able to learn, and as it would seem to merit consideration for such purposes I wish to bring it before the members of this Section.

The name of this color is sulphonated orchil or archil (sometimes called orcin), but in the trades where it is usually employed it is sold under the vague and somewhat misleading name of "Vegetable Red."

Archil is a particular form of the coloring matter derived by the ammoniacal fermentation of certain species of lichens of the genera *Rocella* and *Lecanora,* and probably several others. Prepared in paste form from the foregoing sources the color is known as archil. When it occurs in a somewhat drier condition it is known as persis. In the dry powdered form it is known as cudbear, and this is the form which is most largely known and used in pharmacy. It is an interesting fact, unknown to most pharmacists, that litmus is produced from the same source by adding potassium or sodium carbonate during the fermentation.

The paste archil, when in the unmodified form, has about the same coloring properties as cudbear, but it has been found that by sulphonating it a modification is produced which is very much more effective and satisfactory as a coloring agent. This sulphonation, however, removes it from the class of purely vegetable compounds, and according to some authorities, the presence of the sulphonated color must be declared the same as a coal tar color.

It produces about the same shades and is subject to about the same changes in acid and alkaline media, as cudbear, with the noteworthy difference that it appears to be much more permanent. For instance, an alkaline antiseptic solution, colored with cudbear, when mixed with solution of hydrogen dioxide solution, becomes decolorized in a very short time, while if sulphonated orcin is used to produce the color, the latter is scarcely affected by solution of hydrogen dioxide, even after twenty-four hours' standing.

For private formulas and unofficial preparations, therefore, it may prove to be of value. The cost of the article is the only disadvantage, as it costs from $4 to

$5 per pound, while having little or no higher coloring power than cudbear; its advantage over that color being its greater permanence.

DISCUSSION.

Mr. C. M. Ford stated that every pharmacist is disgusted with cudbear as a coloring agent because of its varying quality. About the only way he can secure uniformity is by buying a large quantity and keep using from that supply. When he gets a new supply he must experiment to get the color he wants. The cudbear obtained from one source will differ greatly from that obtained from another.

Mr. Raubenheimer said that he and Mr. Gardner had a paper on the same subject which they hoped to present at the next session.

In a prescription calling for one ounce of hydrogen peroxide solution and three ounces of alkaline antiseptic solution, he found it did not bleach.

The process he used for making the antiseptic solution was the excellent process which will probably be adopted in the next edition of the N. F., namely, to macerate 2 gm. of cudbear in 1000 cc. of the solution.

Hydrogen peroxide solution in the proportion of 1 to 3 does not bleach the red color of the alkaline antiseptic prepared in this way.

Mr. Sass said that alkaline antiseptic solution made with the tincture would, after standing for some time, become lighter in color and form a white precipitate in the bottom. If the solution be macerated with 1½ gm. of powdered cudbear for six days the color would remain indefinitely.

Mr. Cook stated that orcein had been used by him very satisfactorily, but was very expensive, though only a trace was needed to give sufficient color.

The Committee on National Formulary had been experimenting with color standards and would adopt the expedient of using powdered cudbear with maceration.

THE MODERN SLAUGHTER OF THE INNOCENTS.

The educational system of today is a monumental institution dedicated to Hurry. The children are forced to go through a series of studies that sweep the circle of all human wisdom. They are given everything that the ambitious ignorance of the age can force into their minds; they are taught everything but the essentials,—how to use their senses and how to think. Their minds become congested by a great mass of undigested facts, and still the cruel, barbarous forcing goes on. You watch it until it seems you cannot stand it a moment longer, and you instinctively put out your hand and say: "Stop! This modern slaughter of the innocents must *not* go on!" Education smiles suavely, waves her hand complacently towards her thousands of knowledge-prisons over the country, and says: "Who are you that dares speak a word against our sacred school system?" Education is in a hurry. Because she fails in fifteen years to do what half the time should accomplish by better methods, she should not be too boastful. Incompetence is not always a reason for pride. And they hurry the children into a hundred text-books, then into ill-health, then into the colleges, then into a diploma, then into life,—with a dazed mind, untrained and unfitted for the real duties of living.—*William George Jordan.*

Section on Commercial Interests

Papers Presented at the Fifty-Ninth Convention

MATERIA MEDICA MONOPOLY A HINDRANCE TO MATERIA MEDICA SCIENCE.

F. E. STEWART, M. D., PH. G.

I have recently returned from an extended trip to the Pacific coast, going by way of the Santa Fe and Grand Canyon of Arizona on the A. M. A. special to attend the meeting of the American Medical Association at Los Angeles, and from thence up the coast to San Francisco, Portland, Seattle and Vancouver, and returning via the Canadian Pacific Railroad, stopping over at Glacier, Field, Laggan and Banff, thence on to Minneapolis and St. Paul, to Chicago and from there back to Philadelphia by the Pennsylvania Railroad.

As chairman of your Committee on Patents and Trademarks, I took occasion to confer with physicians and pharmacists at the Los Angeles meeting, and all along the way. And, as I was constantly traveling with prominent physicians, many your personal acquaintances, and thrown into close daily association with them during the trip both on the train and in the hotels going and coming, I had abundant opportunity to learn their views.

One of the subjects upon which we frequently conversed, is the disgraceful state of affairs existing in our materia medica supply business. Tens of thousands of alleged new remedies have been introduced and advertised as therapeutic inventions and discoveries during the past fifty years, and not one tenth of one per cent of them have proved of any special remedial value. These introductions represent hundreds of thousands of useless experiments on the sick by physicians in hospital and private practice, and many more such failures in domestic practice by the self-medicating public. The result has been very disastrous to medical and pharmacal practice, for the people, disgusted with this lamentable history of failures, are turning to the many drugless cults for relief. Now what is the cause of this disgraceful condition? When one considers that medical and pharmacal ethics require physicians and pharmacists to donate the inventions and discoveries made in the practice of their professions to the common fund, and realizes that every one of those tens of thousands of alleged inventions were during the history of their introduction controlled by patents, so-called trade-marks or secret processes, the cause is not hard to discover. The condition is largely due to the ethical lapses of the medical and pharmaceutical professions. This fact was generally recognized by all concerned.

We have departed so far from the professional ideal that it is believed by some that we can never return. Why donate our inventions and discoveries to the common fund? Why not appropriate them for personal gain? Why not individually

monopolize them and reap a financial reward by advertising their virtues? To return to the professional ideal would spell ruin to the medical and pharmaceutical press depending for an income upon the advertising patronage of the manufacturers, and force us all to pay more for our journals. It would spell ruin to the manufacturing houses, depending as they do largely, upon the commercial introduction of these so-called new remedies.

This objection has a very poor foundation. Monopoly of products is not necessary to the existence of advertising. On the contrary, monopoly means only one advertiser for each product. Competition means many advertisers—as many advertisers as there are brands of products.

Neither is monopoly of products necessary to the existence of manufacturing houses who advertise. On the contrary, when there is no monopoly of products cooperation between the medical and pharmaceutical professions and their educational institutions—professional societies, colleges and press—in developing the knowledge of new products, is rendered possible. Such cooperation divides the burden of expense between professional and commercial interests, and thus greatly decreases the cost of commercial introduction imposed upon manufacturers under existing conditions.

When products are monopolized and introduced by advertising, progress in materia medica science and in the arts of preparing and applying medicine to the healing of the sick is greatly hindered. The press can hardly be expected to publish articles in their reading pages which create a demand for monopolized products. Such articles belong in the advertising columns. And it is not to be expected that publishers of medical journals will injure their advertising patronage by publishing untoward reports. Furthermore, it is because materia medica science is not promoted by such discussions that the appalling condition of the materia medica supply business exists.

If the professional press continues to refuse to discuss monopolized products, what shall we do about it? Shall we take measures to force the press to discuss monopolized products? Or shall we take measures to put an end to the monopolies? Or shall we leave things as they are and let them take care of themselves? The latter plan has been tried long enough judging from the disastrous and disgraceful history of the so-called "new remedy" business.

In dealing with this subject, it is important to recognize the distinction between products and brands of products. Quinine is a product. There are as many brands of quinine as there are manufacturers of that product. I believe that every materia medica product—medicinal drug, chemical or preparation—and the currently used name of the same, should be placed on the same basis as quinine. Just as we are in position to discuss quinine without discussing any particular brand of quinine, so we should be in position to discuss every new product introduced to the materia medica.

The advertising of brands of quinine in medical journals in no way hinders progress in science because the journals accepting the advertisements can impartially discuss quinine in their reading pages without being accused of being purchased by quinine manufacturers if they admit paper recommending that product, or running the risk of reprisal if they publish papers dealing with its untoward effects.

On the other hand, monopoly of products gives the commercial introducers control of the publication of knowledge concerning the products, and we have an anomalous condition created in which persons, firms and corporations engaged in the manufacture of monopolized products—ignorant alike of the nature of disease and its treatment—are engaged in teaching the medical profession drug-therapeutics. It is the blind leading the blind. Is there any wonder that both fall into the ditch?

Personally, and after more than a quarter of a century of experience behind the scenes, I am satisfied that with possibly a few exceptions, materia medica monopoly is not only contrary to ethics and a menace to science, but is likewise unnecessary to the success of honest commercial service.

Diphtheria antitoxin was introduced to science as a free product. Almost simultaneously, several brands appeared on the market. Thus cooperation between professional and commercial interests was secured in promoting knowledge concerning it. Knowledge of the methods of preparation and of its therapeutic properties, was rapidly developed by impartial discussion in medical and pharmaceutical societies, colleges and press. The advertising of brands of diphtheria antitoxin in medical and pharmaceutical journals in no way hindered the free discussion of the product itself in the reading columns of the journals. The manufacturers of the several competing brands, through their experts, contributed a large amount of knowledge concerning the product, which promoted progress in science and in the art of manufacturing and using diphtheria antitoxin as a therapeutic agent. At the same time, the manufacturers contributed a large fund to the medical press itself through their advertising patronage, which naturally aided in disseminating accurate knowledge concerning it to the medical profession.

Here we have in marked contrast the commercial and professional systems as applied to the materia medica supply business. The commercial system with its monopoly of product and control of knowledge concerning it by persons interested in its sales is not to be for a moment compared with the professional system with its cooperative research by many impartial investigators working under conditions of environment which eliminate local influences and errors due to the personal equation.

Contrast the history of adrenalin with diphtheria antitoxin. The former was introduced as a monopolized product; the latter as a free product. Prior to the commercial introduction of adrenalin, Von Fürth, Abel and others demonstrated many of the properties of derivatives from the active principle. The investigations of Oliver and Schaefer demonstrated the physiological action of this substance and indicated its usefulness in medicine. Aldrich, independently of Takamine (the patentee of the process under which its sales are now to be monopolized) isolated the active principle from the adrenal glands. All of this work, except the work of Aldrich, was done prior to the investigations of Takamine. Aldrich's work was done simultaneously with that of Takamine.

Prior to the granting of the Takamine patent, the knowledge of the adrenal secretion as a therapeutic agent was being developed by the cooperative work of men of science in various parts of the world, and the published results were accepted in scientific literature without question. This cooperative work was immediately rèndered impracticable by the granting of the patent and the knowledge

of the prior art is now in a sense the property of the patentee and his agents. The Takamine patent has been sustained by the courts, and from now on, as the monopoly will be complete, future publications regarding the product will be largely discredited because of the commercial control over information concerning the product exercised by the manufacturer.

One of the evils of the commercial system now in vogue is the control over materia medica products and information concerning them obtained by registering as trade-marks names to be afterward used as the names of the products themselves. This attempt is now being made in regard to adrenalin. By use, the word adrenalin has become a noun of the common language and is therefore synonymous with all other names used to describe the product or that may be hereafter used. As stated by a well-known author on patent and trade-mark law:

"No one can claim protection for the exclusive use of a trade-mark or trade-name which would practically give him a monopoly in the sale of any goods other than those produced or made by himself. If he could, the public would be injured rather than protected, for competition would be destroyed. Nor can a generic name or a name merely descriptive of an article of trade, of its qualities, ingredients or characterists, be employed as a trade-mark, and the exclusive use of it be entitled to protection.

"The policy that the mere use of a name to designate an article would give to those employing it the exclusive right to designate such article by such name, would be giving a copyright of the most odious kind, without reference to the utility of the application or the length of the title and one that would be perpetual. Neither the Trade-Mark Law nor the Copyright Law, nor the Patent Law affords any such right, or, under the pretense of the same, allows any one to throttle trade under the alleged sanction of law."

The real question at issue before which all other questions sink into insignificance, is this, namely—are the manufacturers of monopolized materia medica products to continue to teach therapeutics? If so, let us adopt some kind of a plan to insure the teaching of truth instead of error. That error is the principle thing taught is manifest by the history of the tens of thousands of materia medica failures, which like wrecks strew the beach of the therapeutic ocean. The spectacle should prove a terrible warning to the medical and pharmaceutical professions alike. The public is taking it as a warning, and we have no one to blame but ourselves for the loss of public confidence in drugs, unless it be that drugs are in fact valueless as remedial agents.

As members of the medical and pharmaceutical professions, it is our duty to investigate and scientifically classify the newer materia medica and protect it from pretense and error. It is our duty to give to each materia medica product a name compatable with scientific nomenclature under which all who have the right may manufacture and deal in it. It is our duty to provide tests for its identification, character, quality and strength. It is our duty to adopt proper methods for its preparation and standardization of finished product. It is our duty to ascertain its true therapeutic value in comparison with other products recommended for the same therapeutic purposes. With the exception of therapeutics, it is the especial duty of the American Pharmaceutical Association to do this work. As for therapeutic properties, we can cooperate with the medical profession in determining the true remedial value of each product introduced. And, as for the patenting of

the product, we can cooperate with the Patent Office in deciding whether it is in fact a *new* and *useful* invention. While the process or method of manufacture may be new and useful, the product itself must not be so considered as a therapeutic agent until so determined by the cooperative investigations of many competent observers, sufficiently extended in time and carried on under circumstances that insure the elimination of undue influence from those who are commercially interested in its sale. As it is the duty of the medical and pharmaceutical professions to prevent its being misused, and as the public look to us to exercise our functions in this regard as members of these professions, a solemn obligation rests upon us in this regard.

Can the evils described in this paper be eliminated without changing our patent and trade-mark laws? It is believed by the Council on Pharmacy and Chemistry of the American Medical Association that this is possible. On my way from California I stopped off in Chicago and had several conferences with the secretary of the Council and the editor of the Journal of the American Medical Association. In their opinion the difficulty is one of interpretation and administration of the law rather than one of fault in the law itself. Patent lawyers and the Patent Office are not educated in medicine or in medical ethics. They regard the subject entirely as one of chemical inventions and do not realize the importance of the subject from a humanitarian standpoint.

It is evident that what we need above all things is a strong central board of control or bureau of materia medica to act as a clearing house for material medica information especially in relation to the newer materia medica products—a board that will act in cooperation with the medical and pharmaceutical professions and the U. S. Patent Office.

The banks have their clearing houses, the merchants their boards of trade, the producers of good their produce exchange. Even the turf has its boards of control. It is realized by all persons engaged in business life that such boards are necessary to prevent selfish exploitation of common interests. Shall we as physicians, pharmacists and manufacturers dealing in products which seriously affect the public health for good or for evil allow selfish, commercial interests to throw these vocations into disrepute with the public by not providing some method of control to prevent it?

We have an organization already existing peculiarly fitted to act as a board of control over the introduction of the newer materia medica products. I refer to the committee having charge of the revision of the United States Pharmacopœia, which was chosen by a very representative convention and is itself peculiarly representative in character. Its function is to investigate materia medica products for the purpose of deciding what products are best adapted for the use of the medical profession in treating the sick. The Pharmacopœial convention very properly limited the work of the committee to the selection of free products because under existing circumstances it is impossible to know the true therapeutic value of controlled products. Possibly for that reason the committee has not the power to do any work on controlled products. However, the American Pharmaceutical Association has the power to appoint a committee for the purpose referred to, and to name as members thereof the same individuals now comprising the committee for revising the United States Pharmacopœia.

It is not my intention to advocate that such a committee or board of control should take upon itself the rendering of therapeutic verdicts relative to the newer materia medica products. As already stated, therapeutic verdicts are the product of cooperative investigation by many competent observers. Such verdicts cannot be obtained except by years of investigation, carried on under conditions which would exclude all local influences, and insure impartiality. But the committee could do the necessary work required for a scientific classification of the products from a pharmacological point of view, and then send them out to the medical profession for a collective investigation of their therapeutic properties.

As the manufacturers of the new products would primarily be benefited by this investigation, they should be willing to cheerfully meet the expense. I, of course, refer to monopolized products.

The proposed collective investigation would be greatly facilitated by the working bulletin system, devised by me in 1882, to act as an organ of the scientific department of the manufacturing houses. As the Scientific Department plan is also one of my own devising, I have had an opportunity to witness the value of the working bulletin system in obtaining information in regard to the newer materia products.

Such a board of control might cooperate with the Patent Office and with the courts in their interpretation and enforcement of the patent and trade-mark laws relative to newer materia medica inventions. I understand that the president of the United States has the right to appoint a commission for the revision of these laws, and presume therefore, that he also has the right to empower the Patent Office to cooperate with such a committee or board of control. Possibly, it would require an act of Congress to accomplish this object. The question is one for investigation.

After conferring with the secretary of the Council and the editor of the Journal of the American Medical Association, as aforesaid, I concluded that it would be wise on my part to bring this matter before you as the report of your Committee on Patents and Trade-Marks. I had already presented to the Section on Pharmacology and Therapeutics a series of resolutions on the subject of Patents and Trade-Marks at the Los Angeles meeting, which was presented by the Section to the House of Delegates and published in the Journal of the Americal Medical Association for July 8, 1911. These resolutions may be of service to the Association in discussing the proposition placed before it in the report of your committee. I have, therefore, appended them to this paper.

WHEREAS, Cooperation between the medical and pharmaceutical profession is essential for the development of materia medica science and the advancement of the art of preparing medicines and applying the same to the treatment of the sick; and

WHEREAS, Progress in materia medica science and in the pharmacologic and therapeutic arts is being hindered and cooperation between physicians, pharmacists and manufacturers engaged in the chemical and pharmacal industries prevented by product patents and the registration of names as trade-marks, which are afterward employed as generic or descriptive names of materia medica products; therefore, be it

Resolved, That we, the Section on Pharmacology and Therapeutics of the American Medical Association, representing the medical and pharmaceutical pro-

fessions do hereby request the House of Delegates to instruct the Council on Health and Public Instruction to draft amendments to the patent and trade-mark laws whereby no patents shall be granted on materia medica products, and the patents shall be limited to process and apparatus for manufacture, leaving the products themselves and the currently used names of the same free to science and commerce.

DISCUSSION.

C. B. LOWE: "Dr. Stewart is an authority on these subjects. You probably all know that when phenacetine was first exploited the medical profession was advised as to its valuable qualities, but as soon as the patent expired the exploitation stopped. Just as soon as the patent expired and the profits lapsed manufacturers dropped it as a dog would drop a hot potato. The article was selling wholesale at *$1.00* an oz., in the United States, and at **$1.75** a pound in Great Britain.

"I suppose it is too much to expect that men generally will take the position that Mr. Scheffer did—the inventor of pepsin who never patented the process—and I have always honored him for giving his discovery to the world.

"There is much more in Dr. Stewart's paper. We have been under the impression that we cannot do anything, and he says we can. According to U. S. law a chemist can patent a process for making a thing, can then patent the product made by that process. You can't copyright the name condensed milk, but you can copyright the name "Eagle Brand" of condensed milk.

"The Librarian of Congress has issued a circular No. 19, in which it is definitely stated that names of medicines cannot be copyrighted. They never were copyrighted."

MR. MAIN: "These things are not copyrighted but trade-marked. The patent office is constantly issuing trade-marks for coined names."

MR. FREERICKS: "Mr. Main is correct on the point he makes; names that are coined by the party first using them are his property. It seems to me there can be no question about that."

MR. STEWART: "Coining a name does not make it belong to you. The common law right is simply the right you have to sign your name to a deed."

C. A. MAYO: "The law is very well set forth in the Singer case and Ludlow valve case. Under his patent, no one could make a Ludlow valve and call it such, but must have on the label 'Not made by Ludlow.'"

MR. HOLZHAUER: "If the telephone had not been patented, but the name had been copyrighted and trade-marked, would not that have given the inventor the exclusive right to use the word 'telephone'? I could not make a telephone and call it by that name, but would be required to call it by some other name."

F. E. STEWART: "When you register the name as a trade-mark you do not get a grant of something as you do when you patent a thing. Under a patent you are given seventeen years' exclusive right to the use of the thing. When you register a word as a trade-mark it does not make a trade-mark out of it; it depends upon how you use it, if you use it generically the word enters language as a noun and becomes public property.

"The Singer sewing machine can be made by anybody and it is a Singer machine.

"Take the case of Angostura Bitters, cited by Curley, in Patent and Trade-Mark Law, in which he calls attention to the fact that the name and brand of an article are patentable as long as the secret is not divulged. The name is the name which has been given to it and used as its name by the producer, and that being so, there is no such right to the ownership or trade-mark which is simply your registration of a name so as to give notice that you make a claim.

"These are questions of common sense and we want to get them in such state in our materia medica that we can get them into the Pharmacopœia without turning the book into an advertising bureau."

COMMERCIAL TRAINING OUTLINE OF THE PHARMACEUTICAL SYLLABUS.

E. FULLERTON COOK, PHARM. D.

In the Pharmameutical Syllabus, First Edition, 1910, recognition has been given to the subject of Commercial Training. Suggestive outlines are offered and about 65 hours of work required in the total of 1000 hours for the complete pharmaceutical course. This 1000 hours of instruction is divided, in the Syllabus plan, into three groups; 300 hours are assigned to the general subject of Materia Medica, 400 hours to Chemistry and 300 hours to the laboratory and theoretical branches of Pharmacy.

Of the 300 hours devoted to teaching the special subject of Pharmacy, 25 are given over to the Theory of Pharmacy, 65 to Practice, 65 to Manufacturing, 50 to Dispensing, 20 to Latin, 10 to Arithmetic, 10 to Bookkeeping, 50 to Commercial Pharmacy and 5 to Jurisprudence. The last three commercial branches, totaling 65 hours, constitute about 22 per cent of the total 300 hours allotted to this division.

Opinion may differ as to the proportion of time, in a pharmaceutical education, which this subject deserves. The prophesy has been made by a well-known writer on this subject that the time is coming when 50 per cent of all pharmaceutical training will be commercial.

However, for present conditions, the framers of the Syllabus have apportioned as many hours for this work, in comparison with the allotment of the remaining 235 hours for pharmacy, as may be wisely given in a 1000 hour course.

Until a larger number of colleges bring their commercial course up to the suggested standard of 65 hours, or until the total hours of training are increased, there should be no enlargement of the proportional time now assigned to commercial training.

The present outline of the Syllabus is excellent in part. The outlines under Commercial Pharmacy, First Year, page 123, and continued for the Second Year, page 125, are helpful, although in many instances quite fragmentary and incomplete. There is some confusion about the teaching of Bookkeeping. Under "Pharmaceutical Arithmetic," page 106, 15 hours of didactic and 5 hours of laboratory instruction are assigned to a course of arithmetic which alone would demand the full time, if satisfactorily treated, while to it is added Bookkeeping—Single Entry—Double Entry—and Commercial Forms. The work required here is out of proportion to the hours.

Later, on page 125, under Commercial Pharmacy, Bookkeeping is re-outlined and most elementary training suggested, such as Theory of Bookkeeping and Necessity for Proper Books of Account, while practical bookkeeping is again called for. Apparently here the bookkeeping work is duplicated.

But the outline most impossible of accomplishment in the allotted five hours, is that on pages 128, 129, 130, 131, 132 and 133 on Pharmaceutical Jurisprudence. However meritorious this detailed course, covering six pages in bare outline, one must despair of teaching it properly in the time assigned.

The outline here again shows a lack of co-ordination in preparing the course, for subjects are duplicated which appear on pages 125 or 126, such as Insurance, Banking, Negotiable Instruments, Partnership and Corporations.

These brief criticisms will serve to call attention to some of the needed changes in the present Syllabus, in the Commercial outlines, but the suggestion of greatest importance here offered is the *method* of teaching. It is believed that subjects should not be taught disconnectedly; for them to properly interest and impress the student, they should be so arranged and grouped that their necessity and importance will be realized. For instance, a completed life history of a business, in miniature, should be experienced by each student; he should be led step by step through the conditions, as nearly as they can be simulated, in which he will need the knowledge; and taught the subject at the time when it can be applied. The facts will then be interesting and will lose their theoretical aspect. The following may illustrate more clearly what is meant:

The course can be started by assuming that the student is about to enter the drug business. This introduces the problems involved in establishing a successful store, i. e., capital, training, location, partnership, buying an established business, starting a new store, professionalism vs. commercialism, etc., and these questions may be discussed at once. Being now ready to assume the responsibility of proprietorship a number of other subjects naturally arise, as, banking, negotiable papers, relations with a landlord, and the lease, store arrangement, ordering supplies, buying to advantage, advertising, store management, salesmanship, letter-writing, insurance (fire, life and indemnity), licenses, establishing personal credit, allowing credit to customers, discounting bills, expenses and their relation to profit, etc., etc.

All these subjects are closely linked with the bookkeeping which will be required, and if the items of business are properly selected, the necessary business facts can be introduced as the course proceeds and explained and illustrated at the proper time.

In so far as legal training is concerned a few principles in the field of general law is about all that a student of pharmacy can safely use. It will be wiser to trust a reliable lawyer when a real need arises. However, in the special branch of laws relating to pharmacy and pure drug legislation, he should be thoroughly grounded, so that no doubt of duty and obligation can exist.

This paper has not been offered in any unfriendly spirit; the value of the Syllabus in bringing about more harmony in Pharmaceutical education is appreciated. The suggestions are presented with the hope that they may aid, by instructive criticism, in the development of a more perfect outline in the next edition.

DISCUSSION.

Prof. C. B. Lowe said he believed criticisms such as those presented in the paper were helpful, because the Syllabus, while a good thing, is a new departure and is not a well balanced book; too much time is allotted to some subjects and too little to others, while the matter in some of the departments has not been wisely arranged. Any one who has taught physiology realizes that the nervous system should be reserved until the end of the course and not at the beginning. In his opinion the one who mapped out that course had never taught physiology to pharmaceutical students, though he may have taught medical students. We had not yet arrived at the point in pharmaceutical education where pharmacy students could take up dis-

secting, and there are many things concerning physiology which cannot be understood without practical work.

Mr. Harry B. Mason said that the framers of the Syllabus did not regard it as a work of perfection but welcomed the most severe criticism. The work had been offered as merely suggestive of what might be brought about in the future. The Syllabus movement, however, when completed will be one of the best steps ever taken in behalf of pharmacy. It means nothing less than the unification of the work of boards and colleges of pharmacy throughout the country. It is a difficult work to get the colleges and fifty-three boards of pharmacy to agree on a definite schedule. The fundamental idea is an excellent one and the details will work themselves out in time.

He had been requested to furnish suggestions to the chairman of his sub-committee, and had directed his criticism exclusively to the section on Commercial Training. He had made the point that nothing had been said about profit and earnings, and no provision made for teaching the student to conduct his business accounting so that he would know how much he made; nothing was said about percentages of gross profit and expense.

Dr. E. F. Cook said that one of the criticisms which must be made of the Syllabus Committee is that in asking the boards and colleges to adopt the Syllabus, it had not been made clear that the work was regarded as being in a constructive state. All would agree that when the Syllabus was perfected we should ask the boards and colleges to adopt it; in its present stage they cannot adopt it in full.

Dr. H. L. Taylor replied that the criticisms made were exactly what were wanted, especially constructive criticisms such as those made by Dr. Cook and Prof. Lowe. He thought there had been general misapprehension of the fact as to what approval by a board of pharmacy meant. He wished to emphasize the fact that the Syllabus was recognized by the committee as being in a crude or formative state. It had been the work of many men and many minds, and further time would be needed to harmonize and correlate their views.

DRUGGISTS CO-OPERATIVE CIGAR MANUFACTURING.

ERNEST BERGER.

Druggist cooperation is not a new proposition,—probably the beginning of it was when the American Pharmaceutical Association was organized,—and from professional cooperation has grown commercial cooperation and the numerous commercial cooperative companies organized by druggists, which, by the way, have been more successful than any other line of business. Fire insurance, wholesale drugs, pharmaceutical manufacturing and others all are financial successes. Why not cigar manufacturing?

The retail druggist can make his cigar case a paying proposition by cooperating in the manufacture of the goods handled.

As a rule, the cigar case in a drug store is looked upon by the smoking public as a side line, with the cigars of an inferior quality, which fact is sometimes accentuated by flashy premiums or trade inducers which are strewn over the showcase, or hung about the walls, or from the ceiling. The average druggist in a small town will not pay over $30 for a five-cent cigar, but will pay $35 per 1000 for a fancy cigar lighter, electrolier or humidor, or some other premium. The same argument applies to goods which are to sell at ten cents.

A discerning smoker knows quality, and he also knows that he is not getting his money's worth in tobacco when he sees all the jim-cracks on display which were sent along as part of the cigar shipment. The discerning smoker generally patronizes a cigar store. He believes that the exclusive cigar store handles the best goods—that the owner knows tobacco and relies upon his judgment.

The drug store must recognize competition. It must meet the exclusive cigar store with as good, if not better, cigars.

By cooperation, by owning their own cigar factory, druggists can sell for five cents a cigar which could not be eualed elsewhere for ten cents.

They would make as much, if not more profit, on each cigar, and double their business in a few months.

They would, by cooperation, eliminate the jobber; they would save express charges.

I live in Tampa, Fla., a city of 54,000 people. We make some cigars in that town. Fifteen thousand people are employed in the 260 or 300 cigar factories. Some of these factories are small, and some employ 1500 cigar rollers. We have a capacity for making 1,500,000 clear Havana cigars each day. We will make 400,000,000 this year. The average price is $85 per 1000. That is nearly $35,000,000 worth of cigars. So I know something about the cigar business.

Our cigars are all hand made. No machinery is used in their construction, except that one or two factories are using automatic banders. The cigar rollers receive from $18 per 1000 to 20 cents each for making cigars. It is interesting to watch the process of making cigars, and the care exercised to make them "free smokers." It is a revelation to follow the process from start to finish—from the time the buyer leaves for Havana to inspect and contract for his leaf, the blending of the various grades of filler (which are trade secrets); the care taken to keep the filler and the wrappers at proper moisture; the selecting, packing, and even the sealing of the cases holding 5000 cigars. Would you believe it that there are as many as 100 shades of cigars? Watch the selector. With a North light on his long and wide table he begins to select the various colors. He works fast. Soon he has a score of piles, all of different shades, then fifty and up to one hundred. The packer then takes fifty to one hundred, as the case may be, all of one color, and he inspects for defects in wrapper or construction, and finally fills his box, after each layer of cigars has been turned and turned until the rows look inviting—good all the way through.

And they go out into the world and find ready buyers—factories in Tampa sometimes are a million cigars behind their orders.

And more factories come to Tampa because they cannot compete elsewhere with Tampa-made cigars—the public is demanding them.

Close proximity to Cuba, where the raw material is obtained, cheap water transportation, and identical climatic conditions enable the Tampa manufacturer to make the same quality as the Havana manufacturer at a considerable saving.

If such firm as Regensburg & Son, New York; Boltz, Clymer & Co., Philadelphia, and a score of other firms of national reputation were obliged to come to Tampa to make cigars, why should not the retail druggists of America profit by their examples?

There is money in the cigar making business. One firm which began business in Tampa in 1898 in a small way now divide $150,000 profits each year. Another firm began business with a net capital of $5000, profits today $250,000. Each $1000 originally invested is held today at $50,000. Another company began with $500 capital. They paid 10 per cent. dividends from the start. Profits now

$20,000 a year. A young man began business here in 1904 with $500. His business today is worth $100,000. I could cite a hundred successes equally as forceful.

Now, if the retail druggists owned a factory they would profit in the manufacturing end and profit in the retailing end.

The manufacturers cited above began business under greater disadvantages than would the retail druggists. The independent factories fought for their business. With the cooperative plan the retail or selling end is already established, and needs only to be enlarged.

The moment a druggists' cigar factory can make a thousand cigars they are sold.

The independent factory has no such arrangement.

The druggists' factory could have a retail selling force pushing its brand for both retail profits and manufacturers' profits.

The independent factory has no such retail force.

Think of ten thousand druggists working day and night to support their factory, and by this endeavor doubling, trebling their cigar business over what it is today—bringing people into the stores to buy cigars and incidentally to buy toilet articles, drugs, and to have prescriptions filled, instead of, as it is today, having these people happen in to get medicines and incidentally to buy a cigar.

Under "American office and expert Cuban factory" management and proper climatic conditions, the co-operative druggists cigar factory is the best proposition before the druggists today.

Take any cigar you can think of which has a national reputation. A high-class salesman solicits the trade. Then the cigar goes from the factory to the jobber, and maybe to the second jobber, and thence to the retailer. Every time the cigar moves from one concern's hands to another the express charges are piled up, every middleman must have his profit.

In the meanwhile the cigars deteriorate. The wrapper is no longer smooth and velvety to the touch, but rough and brittle; it breaks if crushed; the boquet has disseminated; it is not the same cigar that left the factory, as it has been superheated in transit, baked in hot warehouses, and passed through many various degrees of temperature. Maybe you will find the tobacco worm has begun its ravages.

A cigar is a sensitive proposition.

But, if the druggists have a factory of their own, the cigar would go direct from the factory to the retailer. It would come freshly packed, be a few days in transit, and be placed in the humidor of the drug store. You could take the cigar out of the box and nearly wrap it about your finger. It would smoke—not burn up like a torch. It would leave a pleasant taste in the mouth—not blister your tongue.

That's the difference.

And that difference is sufficient to make a buyer of a cigar like that a customer all the time, not a chance customer—or one who buys a drug store cigar because he happens to be in the store to get paregoric, or because he happens to be out of his favorite brand at home, which he buys up town where they sell good cigars.

The cigar bill of an average smoker of good cigars, and that is the kind of

trade you should cater to, is fifty cents a day. If you should only induce 100 regular customers to your store, that would be a cigar trade of $50 daily.

But —

You know full well that where the good trade goes the cheaper trade comes without bidding. You could do $100 a day.

That is true in every line of business.

DISCUSSION.

MR. FRANK H. FREERICKS: "I really do feel that an effort such as has been presented to us by Mr. Berger should not be allowed to go unnoticed. I recall that six years ago, when I presented to the Commercial Section of the A. Ph. A. an outline for a Cooperative Enterprise, and when I found here just one man to give me a little encouragement; that man is here now; he sits at the table there; Mr. Mayo, and I want to express my appreciation for the encouragement he gave me then, and which, I believe, led others on to join in the effort, which I was trying to bring about for the benefit of the drug trade of the country. I am sure that there is in the mind of none of you a doubt, but that such a cooperative effort as here presented can be brought to be for the best interest of the drug trade of this country; something that will be distinctly their own. I believe in all Cooperative enterprises, and the fundamental basis upon which they should be built, is quality. Quality with which no one can compete. In this case, it is a field which, because of the monopolistic tendencies, of the branches of the Tobacco Trade, can be made to benefit the retail drug trade in so many ways, and particularly by making a distinction between the class of goods that they would sell, and the class of goods in the ordinary Cigar Store, and in the United Cigar Stores Stands, which are being distributed throughout the country, and which will not be stopped by any decision of the Supreme Court. Therefore, there is here an opportunity for the retail druggists to secure something unto themselves which will be their own, and which as stated, should be built up on quality.

"I have not the least doubt at all but that this enterprise can be built, and made successful from the start. I only want to suggest to Mr. Berger, with reference to it, and I believe really that because of my experience in that connection, I have a little right to give the expression that I am about to make: If the enterprise is to be carried on, it should be by men, directing it, who will really direct and control the enterprise, so that it will never be in the hands of one man or one set of men, but so that it will truly continue to be a Cooperative enterprise of the retail drug trade of this country. There isn't any trouble at all, to secure that feature, and having secured that feature, I feel that there is not a man in this country now engaged in the drug trade, who should not want to invest a little in such a laudable enterprise."

KNOWING ONE'S STOCK.

Not only the manager, but all employed in a store should know the exact location of the stock. This should be learned so thoroughly that a manager or any one connected with a store should be able to place a hand on any line of goods asked for without the slightest hesitation. Few things create a more unfavorable impression in the mind of the average customer than to have a man behind the counter start out searching expeditions among the shelves and drawers for some particular article that is asked for though it may not be an every day staple. It means much to the reputation of the store if a customer may walk in and call for something a little out of the ordinary; then walk out with the article asked for without any delay. The store that is so stocked that every clerk can immediately place his hand on anything in the stock has a marked advantage over the store where the clerks have to stop and think before they can deliver the article asked for.—*Western Druggist.*

Section on Historical Pharmacy

Papers Presented at the Fifty-Ninth Convention

INFLUENCE OF THE UNITED STATES PATENT SYSTEM ON THE PRACTICE OF PHARMACY.

M. I. WILBERT.

The recent granting of patent No. 1,000,000 by the United States government has attracted considerable attention and has been the more or less direct cause for an unusual amount of discussion on the benefits accruing from our patent system and the probable influence of patents on general progress and on the welfare of the individual members of the community.

That much of what we are pleased to term progress is directly due to innovations introduced under letters patent, is generally admitted, as is the frequently made assertion that the production of patented articles has added materially to the wealth of the nation, has made necessities cheaper and brought luxuries within the reach of even the poorer members of the community.

In the discussion of the general advantages or disadvantages of our present system of awarding patents, the influence exerted along special lines is frequently overlooked, and we need not be surprised to learn that the practice of pharmacy in these United States has been profoundly influenced by the granting of patents and that on at least several occasions the whole trend of pharmacy, first as a profession, then as a business, has been changed by patented articles or products that were used or sold in the drug stores of the country.

It may not be generally known that the first patent awarded in the United States was for an improvement in the process of making a widely used chemical substance, potassium carbonate. This patent was awarded on July 31, 1790, to Samuel Hopkins, and the historian says that the President (George Washington) and his cabinet members congratulated both the inventor and the officials at the Patent Office on the prospect of this patent adding materially to the wealth and welfare of the nation.

The Patent Board of that period consisted of the President and his cabinet officers: Thomas Jefferson, Secretary of State; Henry Knox, Secretary of War, and Edmund Randolph, Attorney General. Jefferson being chairman of the board, was really the first Commissioner of Patents.

Among others of the earlier patents granted in this country for original combinations of matter was the one issued on April 30, 1796, to Samuel Lee, Jr., of Connecticut, for the "composition of bilious pills." This patent was followed by a number of others for more or less similar preparations, and the first decade

of the nineteenth century witnessed quite an agitation over the abuses that had become evidenced in connection with "patent medicines" that were really patented.

Among the many patents on medicines of this early period was one awarded to William Story, of Lebanon, Pennsylvania, for a "medicine to cure hydrophobia," and one to Elisha Perkins, of Connecticut, the inventor of the world renowned "metallic tractors," for a "powerful remedy" for dysentery and ulcerated throat.

These early "patented" medicines were the forerunners of that host of nostrums that has served to convert the American drugstore into a repository of cure-alls and thus divert the energies of the followers of our craft from the more promising possibilities of a professional pursuit.

The nature and even the number of the earlier patents appears to be unknown at the present time, as practically all of the records of the patent office were destroyed by fire in 1836 and the present series of patents dates from that year.

Number 1 of this present series was granted to John Ruggles, July 13, 1836, for an improvement on the locomotive engine, and No. 1,000,000 was granted to Francis H. Holton, on August 8, 1911, for an improvement on the automobile, being in effect a new form of automobile tire. While it is quite probable that neither of these two patents are of direct interest to pharmacists, there are, nevertheless, a great many others whose influence on the progress of the business side of pharmacy can readily be outlined and appreciated.

It is quite probable that apart from the early patents on medicines and the subsequent introduction of trade-marks in connection with the same line of articles, no patents have influenced the development of the drug business to the same extent as did the patents on apparatus for aerated water, the so-called "soda water" of the shops, which served to add to the line of nostrums a line of beverages that were destined to become popular, and in many sections at least, have all but crowded out even a semblance of pharmacy from the modern drug store.

It has frequently been asserted that all progress, or retrogression, is in cycles, and this appears to be particularly true of the drug trade and its relation to the patent system of the United States.

As the drug business of a century ago was profoundly influenced and its development and destinies changed by the granting of patents on medicinal preparations, so the still existing remnant of the trade appears to be destined to be materially changed by the renaissance in the patenting of medicines in the eighth decade of the nineteenth century.

As yet it is too early to predict what the ultimate effect of patenting medicines is destined to be, but up to the present time the practice has certainly not improved pharmacy nor can it be said to have materially benefitted the health or the purse of the average citizen of the United States. Just at the present time, however, we appear to be entering upon an era of conservative inquiry regarding the desirability of granting monopolies in connection with substances that may and do affect the health of the people, and it may be that out of the impending investigation there will develop a new and a better pharmacy, one that will be a factor for progress in the sciences of medicine, and one that will be of service in the pro-

tection of the health of the people and assist in the prolongation of human life and the increase of human happiness.

DISCUSSION.

Dr. H. M. Whelpley inquired as to what proportion of the patents granted were for patent medicines?

Mr. M. I. Wilbert replied that, owing to the destruction by fire of the Patent Office in 1836, it would be difficult if not impossible to ascertain how many of the earlier patents were for medicinal preparations.

Story's Cure for Hydrophobia was patented in 1796, and was one of the earlier patents that appeared in general literature. Comparatively few are so mentioned. One of these is the patent on Lee's Bilious Pills recorded in the proceedings of the Medical Society of Connecticut.

Dr. Lee was a regular practicing physician in good standing, and under the code of ethics, his contemporaries objected to his holding a patent and ejected him from the society. In order to regain his standing, Dr. Lee signed an agreement that the members of the society and others of the medical profession in good standing could use his formula for Bilious Pills without interference.

Mr. Otto Raubenheimer stated that he had in his store,—which dated back to 1870—a jar which was labeled "Lee's Bilious Pills." These had evidently been used up to as late as 1870, since the jar was carefully labeled.

THERAPEUTIC "FREEDOM."

Senator Works, of California, who is a Christian scientist, and whose wife is a Christian science "practitioner," is traveling around the country making speeches against "allopathic despotism." He is very much concerned because the medical service of the army, navy and marine hospital service is in the hands of regulars, and because President Taft has recently made it unlawful for any physician to practice medicine in the Panama Canal zone without passing an examination and securing a medical license.

I suppose that the good senator would very much prefer that a Christian science practitioner should be billeted to every regiment, and one assigned to every ship. By energetic treatment before battle all discomforting wounds could undoubtedly be prevented, all casualties would thus be averted, and the dove-eyed eagle of peace would inevitably roost upon our banners. Also, all diseases could be given comfortable absent treatment over the after-dinner tea, including the great scourage of the camps of Mars—lues venerea.

And what a shame it is that the government should spend all this good money in draining swamps, installing expensive sewage systems, killing off flies, mosquitoes and other troublesome insects (whose tender hearts might be touched by the silent message of Truth), screening dwelling houses, and rigidly enforcing observance of sanitary laws.

Just think how many Christian science temples this money would build!—*Clinical Medicine.*

Reports of A. Ph. A. Committees

THE PROGRESS OF PHARMACY.

Abstracts from the Report on the Progress of Pharmacy for the year 1911, by C. Lewis Diehl, Reporter.

(Sixth Installment.)

Nitrites: *New Method of Determination.*—E. Rupp and F. Lehmann propose a new method for the determination of nitrites, which is based on the fact that nitrous acid is oxidized quantitatively to nitric acid by bromine according to the equation: $HNO_2 + 2Br. + H_2O = HNO_3 + 2HBr$. The reagents required are a solution of potassium bromate containing 1.6702 gms. per litre, and potassium bromide solution containing 6 gms. per litre. When equal volumes of those solutions are added to the nitrite solution and the whole acidified, the calculated amount of bromine is liberated, and the excess over that required to oxidize the nitrite may be determined by adding potassium iodide and titrating the liberated iodine with standard sodium thiosulphate solution. The result is calculated from the equivalents. Fifty cc. of the above bromate solution are equivalent to 30 cc. of N/10 thiosulphate solution. For the determination of the purity of sodium nitrite, for example, 2.5 gm. of the sample are dissolved in 500 cc. of water, and 10 cc. of this solution are placed in a 250 cc. stoppered bottle. Fifty cc. each of the bromate and bromide solutions are run in, 10 cc. of dilute sulphuric acid are added, and the bottle quickly closed, well shaken, and set aside in the dark. After standing for half an hour, 0.5 gm. of potassium iodide is added, the mixture is well shaken, allowed to stand for two minutes, and then titrated with N/10 sodium thiosulphate solution, using starch as indicator. The number of cc. of thiosulphate solution required is deducted from 30, and the difference multiplied by .00345 gives the amount of sodium nitrite in 0.05 gm. of the sample.—Archv. d. Pharm., 249 (1911), No. 3, 214.

Carbon Dioxide: *Solubility in Beer.*—It has been stated that carbon dioxide is more soluble in beer than in the corresponding water-alcohol mixture, the increased solubility being ascribed to the presence of the colloidal substances in beer. It is now known that colloidal solutions do not dissolve gases so well as water, and this is confirmed in the case under consideration by the experiments of A. Findlay and B. Shaw, who find that carbon dioxide is less soluble in beer than in the corresponding dilute alcohol. The erroneous results of previous experimenters are ascribed by the authors to super-saturation.—Pharm. Journ. and Pharmacist, June 24, 1911, 844.

Tellurium: *Aleged Complexity.*—The anomalous position of tellurium in the periodic table has made this element the subject of more researches than any other during the last twenty years. The high values obtained for the atomic weight have led to the supposition that tellurium contains a second element of high atomic weight, but extensive attempts to separate it into two different elements have been unsuccessful. Some time ago, however, Browning and Flint claimed that they had separated tellurium by fractional decomposition of the tetrachloride with water. The tellurium dioxide obtained in this way was converted into the basic nitrate and the atomic weight determined, after ten such fractionations, was given by Flint as 124.3. A. G. Vernon Harcourt and H. B. Baker have now repeated this work, but have been unable to effect and separation. They suggest that the low figure obtained by Flint is due to the presence of some tellurium trioxide in the dioxide.—Pharm. Journ. and Pharmacist, June 24, 1911, 844.

Solution of Sodium Ethylate, B. P.: *Cause and Prevention of Discoloration.*—According to the official description, solution of sodium ethylate is a colorless liquid becoming brown by keeping, and, being only employed occasionally, this discoloration usually happens when kept in stock. H. Finnemore attributes this change of color to the action of the alkali on the acetaldehyde, which is always present in small quantity in commercial absolute alcohol, and after trying various methods to get

rid of this impurity, was most successful by boiling the alcohol for one hour with sodium phenylhydrazone, as employed by Hewitt, and then distilling. A distillate free from acetaldeyde is thus secured, but when kept for a long time some of the latter is gradually reformed and the solution of sodium ethylate becomes discolored. In the course of some experiments on another subject the author observed the great depth of color when sodium ethylate solution was used, whereas, when

Solution of Sodium Methylate was employed no discoloration resulted. The use of methyl alcohol is therefore suggested to prepare an equivalent caustic solution, which, in the experience of the author, using Kahlbaum's No. 1 methyl alcohol, showed no trace of discoloration after two years.—Trans. Brit. Pharm. Conf. (Year Book of Pharmacy), 1911, 425.

Methylenedisalicylic Acid: Preparation and Properties.—According to E. Clemmensen and A. H. C. Heitman, methylenedisalicylic acid ($C_{15}H_{12}O_8$) may be prepared by mixing 32 gms. of salicylic acid, 10 gms. of formaldeyde (40 per cent.), and 180 gms. of 50 per cent. sulphuric acid, and gently boiling the mixture for ten hours under a reflux condenser. The product is powdered, washed with cold water, and finally several times with boiling water to remove any uncondensed salicylic acid, collected, and dried. The yield, by this method, is theoretical. The acid is a white powder of strong bitter taste, and melting at 238° with decomposition. It does not appear to be obtainable in good crystalline form. It is readily soluble in ether, acetone, alcohol, ethyl acetate, glacial acetic acid, slightly in hot water, and insoluble in benzene, chloroform, carbon disulphide, and petroleum ether. From solutions in alcohol, acetone, and glacial acetic acid, it is imperfectly precipitated on addition of water. Its aqueous solutions are colored blue by ferric chloride. Heated above the melting point or with caustic alkalies, it is decomposed into hydroxyphenylmethylenesalicylic acid, methylenediphenol, and carbon dioxide. Alkali and alkali earth carbonates are readily decomposed by it, forming soluble salts, none of which has been obtained in distinct crystalline form. They are precipitated from concentrated solutions on addition of alcohol or sodium chloride. The salts of the heavy metals, made by double decomposition of the soluble salts, are obtained as insoluble colored precipitates. Methylenedicalicylic acid, when precipitated from a soluble salt with a mineral acid, separates in gelatinous form, particularly if the solution is warm.—Pharm. Journ. and Pharmacist, June 10, 1911, 773; from Journ. Amer. Chem. Coc., May 15, 1911, 733.

Strychnine Hypophosphite: Properties.—The ordinary books of reference do not describe the hypophosphite of strychnine and D. B. Dott now supplies the following description: It crystallizes with the composition indicated by $B.H_3PO_2.3H_2O$, all the water of crystallization being lost at 100° C. It is one of the most soluble of the strychnine salts, requiring 3.3 parts of water at ordinary temperature for solution.—Trans. Brit. Pharm. Conf. (Year-Book of Pharmacy), 1910, 422.

Corycavindine: A New Corydalis Alkaloid.—J. Gadamer has isolated from the so-called "amorphous" alkaloids, derived from *Corydalis Cava,* a new crystalline base, which he has named corycavidine, and to which he assigns the formula $C_{22}H_{23}O_5N$. It crysatllizes from a mixture of alcohol and chloroform in colorless, transparent crystals containing about one molecule of chloroform crystallization. Exposed to the air these effloresce and then melt at 212° C. to 213° C., being converted thereby (at 209° C.) into an optically inactive base, melting-point 193° C. to 195° C., probably iso-corycavidine. Corycavidine gives a reddish-yellow solution with strong sulphuric acid, which turns greenish-grey on heating. It gives an olive-green with Froehde's reagent; a dirty reddish-brown with Mandelin's reagent. It forms a crystalline nitrate, and hydrochloride; the aurichloride $C_{22}H_{23}O_5N.HClAuCl_3$, is a red powder, which sinters at 80° C., and decomposes at 170°.—Arch. d. Pharm., 249, 1911, No. 30.

Morphine: Quantitative Determination of Small Quantities.—Objections having been raised to the method of Rübsamen for the quantitative estimation of small quantities of morphine, the method has been investigated by R. Gottlieb and O. Steppahn. According to this method the morphine is extracted from solutions of its salts by making just alkaline to phenolphthalein and shaking repeatedly with large volumes of chloroform, afterwards distilling off the chloroform and determining the morphine in the residue by Gordin's method. The authors find that good results can be obtained by proceeding as follows: The solution must be only just al-

kaline to phenolphthalein, and since the alkalinity is diminished by the extraction, more N/10 alkali is to be dropped in as required; instead of shaking with the chloroform, it is better to mix the two liquids in a beacker with a stirrer for ten minutes at a time, adding alkali as required; the chloroform should have been well stirred with pure water first, and about 600 cc. should be used each time for extracting 200 cc. of the aqueous liquid. After the ten minutes stirring, the whole is transferred to a separator, and the chloroform run off, and the operation repeated three or four times. The united chloroform solution is distilled, the last portion evaporated in a dish, and the morphine dried; a known excess of N/10 sulphuric acid is then added, and enough absolute alcohol to take all into solution, and the determination concluded by Gordin's method. A number of control determinations showed that about 90 per cent. of the morphine is obtained.—Apoth. Ztg., XXV (1910), No. 105, 1054; from Arch. f. Exper. Pathol. u. Pharmacol., 64 (1910), 54.

Erythrina Zeyheri: Constituents of the Seeds.—E. Langham has subjected the seeds of *Erythrina Zeyheri,* a leguminous South African plant, to chemical examination. This plant has an average height of 45 cm. The stem, leaves and leaf-stems are covered with prickles, which emerge from the ribs on the stems and the veins on the leaves, and on the stems towards the root, thus affording some protection from being eaten by ruminants. The seeds are covered with scarlet testa, and contain a quantity of a bland, nutty oil, a volatile oil, and an alkaloid. The seeds of *Abrus precatorius,* also of the same order of plants, possess scarlet testa, but with a black spot on one side, and are used for making rosaries and necklaces. The seeds of *Erythrina Zeyheri* are also employed by Kafirs in South Africa for making necklaces. The color of the seed integuments does not yield itself to chloroform. The ripe seed-pods vary in length from 4 to 12 in. (10 to 30 cm.); the average weight of each seed is 20 grains. They yield to ethereal extraction, 28% of fixed oil, and 4% of volatile oil (*Erythrol*), the latter being powerfully irritant and having the pungent odor of horseradish, while the fixed oil is simply an aperient, free from pungency. By alcoholic extraction, an alkaloid (*Erythrine*) is obtained in a yield of .15%. This is insoluble in ether or benzol, and gives a purple precipitate with auric chloride, while when boiled with ammonia or caustic potash its solutions assume a sap-green color. It also gives the characteristic reaction with Thresh's alkaloidal reagent. Touched with nitric acid, erythrine gives a bright color, changing to red; with sulphuric acid it gives a dull red color. When boiled with dilute sulphuric acid it splits off *Erythringen,* and the resulting solution when rendered strongly alkaline with caustic potash and warmed with cupric sulphate, throws downs a crimson-scarlet precipitate.—Chem. and Drug., April 28, 1911, 134.

Siam Benzoin: Botanical Source and Collection.—Haidman Rordorf, having received from Dr. Domeller Nieuwenhuis, who is the Dutch Minister in Siam, authentic leaves, twigs, bark and resin derived from trees growing in the northwestern Province of Kiang Mai, in the district near the source of the Meping river, contributes some interesting information concerning the botanical source and collection of Siam Benzoin. The leaves are described as 11 ins. to 12 ins. long and 4 ins. to 5 ins. broad, leathery, longish-ovate, and acuminate. The margin of the leaf is slightly undulate and entire. The upper surface is of a dark olive-like green color and glabrous. The midrib and lateral veins are of a clear brown color and very prominent. The smaller veins are somewhat prominent also. The under surface is of a paler olive-green color filled with abundant appressed stellate hairs. The whole vegetation is reddish and clearly outlined and covered with stellate hairs. There are five or six lateral veins on each side, nearly at right angles to the midrib, at first curved, and then running along the leaf margin, in which they terminate. The leaf stalks are 1 in. long and colored like the veins, and also covered with stellate hairs. In the axils of the leaves there are small buds and leaflets 1 in. long. Mr. Rordorf lays special stress on the fact that two kinds of buds occur in the leaf axils, that the stellate hairs on the leaves are not the same as those of *Styrax Benzoin,* and that the leaves are entire, whilst those of *S. Benzoin* are serrate-toothed. The author also described the method of collecting the drug by the inhabitants of a small settlement—small long-haired people, who apparently emigrated from China in very early times. They speak an old, forgotten language, and wear different clothes to the natives of Southern Siam. Their method of collecting the benzoin and

preparing it for the market is as follows: On trunks of 20 cms. in diameter pieces of bark of rectangular shape from half to four handsbreath in size are loosened, and the resin runs out on the inner side of the bark ,solidifying there by the heat of the sun. This forms the finest quality. The smaller fragments are formed into lumps by hand. The resin is spread out on a strong mat in a heap, and ginger roots, first hollowed and filled with the marrow of the bones of the pig, are mixed with it, and the mats are tied up at the ends into a bundle. The contents are examined from time to time to see if the fat has been taken up, and if not fresh fat is used. It is said that rancid pork fat will not, like fresh fat, pass through the ginger root. This process takes about one year, its object being to give a fine aroma. When the fat has disappeared from the ginger the drug is ready for export without risk of losing its fine odor through the hot and long journey to Bangkok.—Schweiz. Wschr. f. Chem. u. Tharm., XLVIII (1910), No. 36.

Nigerian Gums: Source and Characters.—According to Dr. J. M. Dalziel, the term "Nigerian Gum" is given to any white or nearly colorless gum collected in the Bornu and Yola provinces, gum culture being unknown in Nigeria, and the desultory collection being done at random. The hashab tree of the Kordofan district, *Acacia Senegal,* is abundant in the Bornu province, where gum is a predominating forest product. In the Yola province a large acacia, probably A. Sieberiana, is pointed out as the source of falli. Murrua (the term given to yellowish or reddish varieties of gum) is with little doubt the product in Yola of *A. Seyal,* though some may be derived from *A. xanthophlaea.* Both falli and marrua are in the form of large tears, lumps, or broken fragments, or, occasionally, pencils. Falli becomes opaque owing to the formation of fine fissures, but marrua usually retains its glassy surface. Most of the gum gathered in the Yola province consists of mumuye, which is in lumps or masses of a dark or smoky appearance, and is derived from one or more species of *Combretum,* usually *C. leonese.* The resident of the Bornu province states that four trees in that country yield gum of marketable value, viz., Kolkol (*Acacia Senegal,* Willd.), karumga (*Acacia Seyal.* DC.), Katalabu (*Acacia Sieberiana.* DC., probably), and gulawai. The identifications were made at Kew. The investigations established the fact that the principal sources of gum in Bornu and Yola are the same species as the important Sudan and Senegal gums. Also that it is not improbable that by educating native collectors much of the variability in quality of Nigerian gum could be avoided. The main results of the investigations are summarized below:

Source of Gum	Moisture Per cent.	Ash Per cent.
Bornu Province,		
Acacia Senegal ...	10.2-11.4	2.8-3.1
Acacia Seyal	11.1-11.4	2.5-2.6
Yola Province,		
Acacia Suma	13.3-13.5	2.0-2.3
Acacia Sieberiana	13	2.6
Sokoto Province,		
Combretum sp....	12.6	2.0

Source of Gum	Matter Insoluble in Water Per cent.	Strength as Measured by Viscosity
Bornu Province,		
Acacia Senegal ...	1.2-1.9	5.3-6.6[1]
Acacia Seyal	0.8-1.4	5.8-6.6[2]
Yola Province,		
Acacia Suma	4.1-4.5	14.1-16.7[3]
Acacia Sieberiana.	0.7	13.3[4]
Sokoto Province,		
Combretum sp....	1.2	7.8[5]

Color of Mucilage—[1]Almost colorless to pale brown. [2]Brown. [3]Colorless to brown. [4]Pale color. [5]Dark brown.

Chem. and Drug., March 11, 1911, 90; from Bull. Imper. Inst., VIII, 1910, No. 4.

Bartsia Odontites: Mannitol an Abundant Constituent.—In the course of experiments on the herb of *Bartsia Odontites,* in England a very common wayside plant of the N. C. *Scrophulariaceae,* undertaken to determine a possible toxic constituent, similar in activity to digitalis, H. Finnemore and G. E. Town obtained by continuous extraction with hot alcohol, a concentrated liquid from which a fairly large amount of crystalline matter separated on standing. This, on examination, proved to be mannitol, which was identified both by composition and melting point, and by that of the acetyl derivative. No active constituent was revealed by this investigation. —Trans. Brit. Pharm. Conf. (Year Book of Pharmacy), 1911, 444.

Cimicifuga: Chemical .Examination.—H. Finnemore has made a systematic chemical examination of the rhizome of *Cimincifuga racemosa,* resulting in the isolation and identification of the following constituents: *Isoferulic Acid,* to which he assigns the constitu-

tional formula $C_6H_6O(COOH)(OCH_3)$, and from which he prepared the acetyl derivative, having the composition $C_6H_5(OAc)(COOH)$. The melting point (146°) and other properties of this derivative, agree with those of *Hydroisoferulic Acid*. A small quantity of *Salicylic Acid*. A trace of substance having the melting point 152° *Palmitic Acid*. A *Phytosterol*. Three crystalline bodies, apparently *Alcohols*, one of which has the empirical formula $C_{14}H_{22}O_4$, the other two being represented by the formula $C_{15}H_{22}O_4$. Tests for *Alkaloids* gave evidence of their presence in very small amount—too small, however, to justify further research.—Trans. Brit. Pharm. Conf. (Year-Book of Pharmacy), 1910, 435-444.

Podophyllum Emodi: *Superiority of the Yield and Activity of the Resin.*—Referring to his researches on the resin of *Podophyllum Emodi* communicated in 1892 (see Proceedings, 1303, 630), John C. Umney contributed some further notes at the 1911 Meeting of the British Pharmaceutical Conference, in which he records the results of recent examinations of rhizomes collected, in accordance with his suggestion, under different conditions and at different seasons. The present investigation is more than ever convincing that it is upon natural variations in the resin, most probably at different seasons of the year, that the varying results (recorded by different workers) have been obtained. All workers are agreed that the proportion of resin in the Indian variety (*P. Emodi*) is an average twice that of the American (*P. peltatum*); but in judging of the relative value and composition of the resins obtained by different workers, it is but easy to arrive at conclusions because of differences in process and nomenclature. It would certainly appear, however, that "picropodophyllin" is not an actual constituent of the drug, but is formed by decomposition of "podophyllotoxin," which, together with "podophylloresin," an indefinite amorphous substance, represents the activity of the drug. The distinction of the two varieties of the drug is, however, not confined to the greater yield of resin from the Indian drug, but in that the resin from the present Indian material (collected after fruiting in 1910) contains twice as much podophyllotoxin as the resin from Indian rhizomes examined in 1892, or that obtained from the American (*P. peltatum*)—the actual figures obtained being: Indian, 1892, 25.0%; Indian, after fruiting, 50.3%; *American*, (*P. peltatum*), 22.9%. The difference in the two Indian varieties, the author conjectures is due to the period of collection, the rhizomes of *P. Emodi* collected after flowering being much richer in podophyllotoxin and consequently of greater activity than the rhizome of 1892, the collection period of which is not known.—Trans. Brit. Pharm. Confer. (Year-Book of Pharmacy), 1911, 388-391.

Insect Flowers: *Nature of Poisonous Principle.*—Referring to the investigation of insect flowers, which he undertook in 1880, in collaboration with Schlagdenhauffen, E. Reed now confirms the original statement that the toxic constituent of the insect flower is an acid, which they had named "pyrethrotoxic acid." To obtain this principle, Dalmatian insect powder is extracted by percolation with petroleum ether. By treating the soft extract left on distilling off the solvent, with a small quantity of alcohol at 60° C., a white powder, melting point 125°C., is separated. This is the magnesium compound of a resin which is named pyrethresin. The resin has an acid reaction. After removing this "pyrethresin" the residue is an oily mass containing an amorphous sugar. The residual oily substance is partly soluble in 3 per cent. potassium hydroxide solution. On treating this alkaline solution with tartaric acid, and shaking out with ether, that solvent, on evaporation, leaves a honey-like mass of pyrethrotoxic acid. Instead of treating the original petroleum ether residue with alcohol, it may be extracted with a 60 per cent. solution of chloral hydrate, and the solution thus obtained is shaken out with petroleum ether.—Pharm. Zentralh. LII (1911), No. 7, 173.

Indian Hemp: *Questionable Value of the Iodine Number.*—The recent suggestion by D. Hooper (1908) of a method for the commercial valuation of Indian hemp products based upon the iodine value of the active constituent, cannabinol, has elicited an inquiry into the possible value of the method for the standardization of these preparations in place of the present physiological one, by C. R. Marshall and J. H. Wigner, constituting a therapeutic committee of the British Medical Association. The method, it seemed to them, would be of value for purposes of standardization only if the active principle (or some inert substance which always accompanies it in a fixed ratio and is not easily removable

and pharmacologically inert a relatively low iodine value, or viee versa. If physiologically inert or almost inert substances possessing an iodine number approximating to that of the active principle occur in variable proportions in preparations of Indian hemp, the method is obviously of no value as a means of standardization. Unfortunately this appears to be the case. In order to reduce the sources of error, the authors decided to work with pure or approximately pure principles. They examined: (1) A sample of original cannabinol prepared by Wood, Spivey, and Easterfield in 1897, which had been kept in a sealed tube for eleven years, and which when tested appeared to have lost little, if any, of its pharmacological activity; (2) the same cannabinol after oxidation by a current of dry air, a process which has been shown by one of the authors to diminish its pharmacological activity; (3) various fractions obtained by the distillation of an extract of the same "charas" from which the above cannabinol was prepared.

The following iodine values, as determined by Hübl's method, are typical of those obtained:

FRACTIONS OBTAINED FROM 12-YEAR-OLD "CHARAS."

	Iodine No.
Original cannabinol (strongly active).	189
Original cannabinol (after oxidation)	184
Lower terpene fraction.....	67
Higer terpene fraction.....	180
Residue after distilling off terpene (very slightly active).....	196
Fractions boiling at 280° to 300° C. at 15 Mm. Hg. pressure (very slightly active)	247
Ditto (after oxidation).....	229

The figures show that the very active sample of cannabinol gives a lower iodine number than similar and almost inert samples prepared from old charas; that the oxidation of cannobinol, although diminishing considerably the physiological activity, does not greatly lower the iodine value; and that the iodine number of the higher boiling terpenes, which possess no characteristic cannabis effect ,approximates closely to that of active cannabinol. The determination of the iodine number seems, therefore, to be of no certain value as a means of estimating the pharmacological activity of cannabis preparations, and, consequently, it cannot be used as a substitute for physiological standardization.—Pharm. Journ. and Pharmacist, June 3, 1911, 740.

Extract of Indian Hemp, B. P.: Comparison with the Non-Official Commercial Extracts.—As pointed out by Dr. Hooper (see Proceedings 1895, 573), the official (B. P.) extract of Indian hemp is composed of a mixture of a green resin and brown water-soluble extractive matter. Merson (1904) showed that this brown extract was not readily soluble in alcohol ,and that commercial extracts varied largely in the proportion of this substance they contain. Harold Dean has now made a series of experiments, the results of which are exhibited in three tables: one, based on the examination of various samples of Indian hemp, indicating the proportions in which the two components may be expected in the extract; the other two, showing the results of the examination of commercial samples of the extract. The results obtained fully bear out the numerous criticisms that have been made as to the variability of this extract as supplied by manufacturers. Nevertheless, the non-official extracts are preferred to the official, their predominence being due to the fact that the pharmacopœial preparation is unsatisfactory, being composed of two constituents, the resin and the brown extraction, which show a tendency to separate, and, moreover, is incompletely soluble in alcohol, which makes the preparation of the tincture troublesome and messy. Therefore a demand has arisen for an extract soluble in alcohol, and there is a general idea that the B. P. extracts ought to be soluble in alcohol. Such an extract can be obtained by the simple method of washing away the brown extraction with warm water, after the spirit has been distilled off, there being little doubt that only the resinous portion of the extract contains the active principle. No doubt this is the method by which most of the soluble commercial samples mentioned in the table were obtained, and the author urges that this method be adopted in the B. P.—Trans. Brit. Pharm. Conf. (Year-Book of Pharmacy), 1911, 402-406.

Tincture of Opium, B. P.: Loss of Morphine in Its Preparation.—From time to time statements have been made to the effect that in the conversion of opium into extract or tincture a loss of alkaloidal results, or to put the matter with strict accuracy, that the quantity of morphine shown by the official assay of a sample of opium is always greater than the finished product, even when the utmost

care has been taken to secure the perfect exhaustion of the drug. E. H. Farr and R. Wright, with the view of testing the accuracy of these statements, have now made experiments on the preparation of the Tincture, which they describe in detail, with results that go to prove that when the official methods are followed throughout there is always a loss of morphine. In seven samples of opium worked upon this varied between the limits of 0.8 per cent. and 9.0 per cent. of the whole, with an average for the whole series, as shown in the tabulated statements of the results obtained. In the light of these results it is evident that, notwithstanding the amount of careful thought and experimental work which has been devoted to the subject of opium assay, there is still room for a thorough and systematic review of the whole subject. The loss appears to the authors to be probably due to occlusion of the alkaloid, rendering the complete extraction by water or alcohol a matter of practical impossibility, or to some other factor or factors which have hitherto escaped recognition.—Trans. Brit. Pharm. Conf. (Year-Book of Pharmacy), 1911, 392-399.

Aromatic Fluid-Extract of Cascara Sagrada: New Formula and Process.—Introducing the subject of an improved formula for making an aromatic fluid extract of cascara sagrada, R. C. Cowley observes that the physiological activity of glucoside containing drugs does not depend always on the glucosides and that this possibly explains the increased activity of cascara sagrada by aging the bark. From the experience of others, and more particularly from that recorded by White and Robinson in 1902 (see Proceedings 1903, 801), the author assumed the presence of a fermentable glucoside in cascara sagrada, and that the activity of this drug is at least in part due to the products of its decomposition. He had, moreover, found by digesting the powdered bark with water and a small proportion of emulsion that the percolate required a much larger proportion of ammonia for neutralization than when the drug was exhausted by water alone; and, furthermore, that when alkalinity was maintained during evaporation, the extract was free from the bitterness of cascara sagrada, and it still maintained its activity. He therefore conceived the idea of effecting the hydrolysis of the glucosides of the bark by preliminary treatment with acid and water, the experiment resulting in the adoption of the following method for preparing an aromatic fluid extract:

Cascara Sagrada (No. 20 powder)	20 oz.	100.00
Diluted Sulphuric Acid	1 fl. oz.	5.00
Alcohol (90 per cent.)	4 fl. oz.	20.00
Oil of Coriander	20 minims	0.21
Oil of Orange	20 minims	0.21
Spirit of Chloroform	80 minims	0.84
Gluside (soluble)	13 grains	0.15
Liquid Extract of Licorice	4 fl. oz.	20.00
Solution of Ammonia.		
Distilled Water, of each a sufficient quantity.		

Boil the cascara sagrada with 7½ pints (750) of distilled water and the diluted sulphuric acid for two hours; allow the mixture to stand for twenty-four hours, then pack in a percolator and percolate with distilled water until the cascara bark is exhausted. Neutralize the percolate with solution of ammonia, and evaporate on a water bath to 12 fluid ounces (60), maintaining slight alkalinity throughout the operation by the further addition of solution of ammonia from time to time. Dissolve the oils and gluside in the alcohol, and the spirit of chloroform and the liquid extract of licorice. Mix this with the concentrated solution of cascara bark, and, if necessary, make up to 20 fluid ounces (100) with distilled water. The product is very elegant and possesses undoubted activity.—Chem. and Drug., July 22, 1911, 46.

Disinfectants: Bacteriological Testing and Standardization.—At the forty-seventh Annual Meeting of the British Pharmaceutical Conference (1910), several interesting papers were read and discussed at length on the bacteriological testing and standardization of disinfectants. Prof. Sims Woodhead read a paper by Dr. Constant Power and himself on the "bacteriological standardization of disinfectants," in which the authors fall back on a comparative valuation of disinfectants, taking phenol as their standard, and using a modification of the Rideal-Walker drop method, as giving promise in theory of the most precise results, they discuss the following factors: Organisms to be acted upon; number of micro-organisms and amount of organic matter to be added; strength and number of dilutions ;time during which the disinfectant is allowed to act; temperature.

Prof. R. Tanner Hewlett read a paper on the *"Woodhead-Power method of testing disinfectants"* (above outlined), in which he questions the necessity of "seeding" the subcultures with more than a standard loopful. He thinks that the use of *Bacillus coli* instead of *B. typhous* is probably a desirable change, although this depends on further investigation.

C. T. Kingsett read a paper by R. C. Woodcock and himself on the subject of *"Bacteriological testing of certain disinfectants and the results as affected by varying conditions,"* dealing mainly with commercial disinfectants of the coal-tar order, classifying them into "Emulsified Disinfectants" and "Homogeneous Disinfectants." The normal Rideal-Walker co-efficients in respect of *Bacillus typhosus* were first determined, then the normal co-efficients with regard to other germs, the influences of higher temperature as affecting the *B. typhosus* co-efficient, and an extension of time, simply or coupled with a higher temperature. The results are tabulated for purposes of ready comparison, and they appear to show that while the R.-W. test may very well serve to determine the relative germicidal values of similarly prepared preparations of a coal-tar nature, it is not applicable for ascertaining the real or relative values of other disinfectants of a different chemical nature.—Trans. Br. Pharm. Conf. (Year-Book of Pharmacy), 1910, 329-362.

Pharmaceutical Formulas

PROPOSED FOR A. PH. A. RECIPE BOOK.

(Continued from page 506)

The present installment consists of formulas which the writer has collected from various sources. A great many of these preparations are frequently prescribed, but the average pharmacist can not readily find the formulas.

Special attention is called to the apparent inconsistence in the proportion of salicylic and boric acid in Thiersch's Solution No. 45, and Thiersch's Powder No. 46 as per formulas quoted from the Hospital Formulary of the Department of Public Charities, N. Y. City.

Greater uniformity is undoubtedly very desirable.

Comments and criticisms are invited.

Respectfully submitted,

OTTO RAUBENHEIMER, Chairman.

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Abbreviations can be found iu May JOURNAL, p. 504.

Formulas No. 1 to 32, see February JOURNAL, p. 169 to 173.

Formulas No. 23 to 30, see April JOURNAL, p. 366 to 368.

Formulas No. 31 to 41, see May JOURNAL, p. 505 to 506.

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No. 42.

UNGUENTUM IODI DENIGRESCENS.

Stainless Iodine Ointment.

Iodine	5 gm.
Petrolatum	95 gm.
To make	100 gm.

Melt the Petrolatum and gradually add the Iodine in fine powder with constant stirring. Continue heating until the combination is completed and then stir until cool. This ointment has the great advantage of being absorbed when rubbed on the skin without causing a stain.

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Can. Form.

No. 43.

UNGUENTUM ICHTHOLOLIS, 10 PER CENT.

Ichthyol Ointment 10%.

Ichthyol	10 gm.
Hydrous Wool-fat	45 gm.
Yellow Petrolatum	45 gm.
To make	100 gm.

Melt the Hydrous Wool-fat and the Yellow Petrolatum (which mixture is official in the new German Pharmacopœia as *Unguentum Molle*, Formula No. 7), and when cool incorporate the Ichthyol, which chemically is ammonium ichthyol sulphonate.

NOTE: This ointment will darken very considerably by age and the attention of physician and patient should be called to this.

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No. 44.

UNGUENTUM IODI LUGOL.

Lugol's Iodine Ointment.

Pommade iodurée (Lugol).

	No. 1	No. 2	No. 3
Potassium Iodide.	1.2 gm.	8.0 gm.	10.0 gm.
Iodine	0.6 gm.	1.0 gm.	1.2 gm.
Lard	60.0 gm.	60.0 gm.	60.0 gm.

Dissolve the Potassium Iodide in a little water or glycerine, add the Iodine and triturate until dissolved and incorporate the Lard. —Dorv.

No. 45.

LIQUOR BORO-SALICYLATUS.

Boro-Salicylated Solution.
Thiersch's Solution.

Salicylic Acid	2 gm.
Boric Acid	12 gm.
Water, a sufficient quantity	
To make	1000 cc.

Make a solution.
Bellevue Hospital Form.

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No. 46.

PULVIS BORO-SALICYLATUS.

Boro-Salicylated Powder.
Thiersch's Powder.

Salicylic Acid	1 part
Boric Acid	8 parts

Mix intimately.

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No. 47.

CARBASUS BORO-SALICYLATA.

Boro-Salicylated Gauze.
Thiersch's Gauze.

Boro-Salicylated Powder	1 part
Sterilized Water	50 parts
Gauze, a sufficient quantity.	

Saturate the absorbent Gauze with the solution and retain it therein completely immersed for at least 24 hours. Then wring it out, more or less completely, as may be required.

NOTE: It will be noticed that the proportion of salicylic and boric acid is 1 and 8 in the powder, but 1 and 6 in the solution. It would be very desirable to have uniformity and perhaps even percentage strength as f. i. 1 and 9.—O. R.

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No. 48.

COLLYRIUM ADSTRINGENS LUTEUM.

Yellow Astringent Eye Lotion.
Ph. Aust. VIII.

Zinc Sulphate	5 parts
Ammonium Chloride	2 parts
Camphor	2 parts
Saffron	1 part
Diluted Alcohol—68%	100 parts
Water	890 parts
To make	1000 parts

Dissolve the Zinc Sulphate and Ammonium Chloride in the Water and add the solution of the Camphor in the Diluted Alcohol. Lastly add the Saffron, set aside for 24 hours, agitating frequently and then filter.

Yellow Astringent Eye Wash is a clear yellow liquid of astringent taste and with an odor of camphor and alcohol.

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No. 49.

PASTA ZINCI MODIFICATA.

Modified Lassar's Paste.

Zinc Oxide	12.5 gm.
Starch, in fine powder	12.5 gm.
Ointment of Rose Water	75 gm.
To make	100 gm.

Mix thoroughly.

This ointment has the advantage of cooling properties.

Skin and Cancer Hospital, N. Y.

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LIQUOR AMMONIÆ DETERGENS.

Detergent Solution of Ammonia.
Household Ammonia.

Stronger Ammonia Water	300 cc.
Oleic Acid	60 cc.
Alcohol	60 cc.
Distilled Water, a sufficient quantity	
To make	1000 cc.

Mix.

About 5 per cent. of Borax may be added if desired, together with a little oil of lavender or other suitable perfume.

NOTE: If a "cloudy" preparation is desired, about half of the distilled water should he replaced by "hard" tap-water, the exact proportion depending upon the amount of total solids in the hard water.—B. P. Cx.

Editorial Notes and Announcements

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C. LEWIS DIEHL.....Louisville, Ky.
Associate Editor and Reporter on the Progress of Pharmacy.

All communications for insertion in the JOURNAL, or respecting advertising should be sent to the Editor.

The Association does not accept responsibility for the opinions of contributors. Offensive personalities must be avoided.

Under the rules of the Post Office the JOURNAL can be regularly mailed only to bona-fide paid subscribers. Subscriptions and association dues should be sent to the Treasurer, H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.

Requests for back numbers, and claims for missing numbers should be sent to the Editor.

Claims for missing numbers will not be allowed if sufficient notice has not been given of change of address, and in no case if received later than sixty days from the date of issue.

In giving change of address, always give both the old and the new address.

RULES OF CENSORSHIP.

1. All contracts for advertising are accepted subject to revocation at the discretion of the Publication Committee.

2. No advertisement will be accepted for any article or service, the sale or furnishing of which is illegal in the state of publication or in any state in which the JOURNAL circulates.

3. Advertisements will not be accepted for articles belonging to the class of preparations commonly known as patent medicines, nor for any medicinal preparation advertised directly to the laity, or which is advertised in such a manner as to encourage self medication.

4. Copy which is vulgarly or extravagantly worded, or which makes extravagant claims of therapeutic virtues will not be accepted.

5. No advertisement will be accepted which by intent or inference would result in deceiving, defrauding or misleading the reader.

REPRINTS.

The Stoneman Press Co., Columbus, O., will furnish reprints of papers appearing in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION at the prices named below, when the order is received before the type has been distributed:

50 copies, 4 pages, no cover, $2.25, with cover, $4.00.
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50 copies, 12 or 16 pages, no cover, $4.00, with cover, $5.50.
100 copies, 12 or 16 pages, no cover, $5.00, with cover, $6.50.
200 copies, 12 or 16 pages, no cover, $6.50, with cover, $8.00.

Orders for reprints may be sent either to the Editor, or to the Stoneman Press Co.

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DENVER MEETING.

Denver people never do anything by halves; their usual method is to observe how other cities have done a thing and then to improve upon it. What they have in contemplation for the entertainment of the Sixtieth Annual Convention of the American Pharmaceutical Association, August 19-24, is partially shown in the tentative program which appears in a Council letter published in this issue.

From this program, it is apparent that the visitors will need to bring their full enjoyment capacity with them in order to absorb all of the various entertainments the Denverites have provided. The day's excursion to Glacier Lake will, according to all accounts, furnish an outing that for variety of scenery can not easily be excelled.

This issue also contains proposed routes of travel with information concerning rates from states both east and west. Members interested in having any change made in the program of meetings and entertainment should send their propositions to the Council Secretary. Those who have suggestions to offer concerning routes of travel proposed, should send them to the Chairman of the

Transportation Committee, Mr. Caswell A. Mayo, 66 W. Broadway, New York City.

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ROUTES AND RATES FOR THE DENVER MEETING.

Preliminary Report by the Committee on Transportation.

Members are requested to express their preferences to the Chairman of the Committee.

The Committee on Transportation has been in consultation with all the railroads leading to Denver and requests the members of the Association to express their individual preferences by letter or postcard directed to the Chairman of the Committee, Caswell A. Mayo, 66 West Broadway, New York, answering the following questions:

1. Which of the following routes do you prefer—A, B or C.?

2. Which excursion, if any, will you take after the meeting?

ROUTE A.

FRIDAY, AUGUST 16—Leave New York (Lehigh Valley), 9:55 a. m. Leave Philadelphia (Lehigh Valley), 8:30 a. m. Leave Buffalo (Grand Trunk), 10:55 p. m.

SATURDAY—Arrive Chicago, 1:30 p. m. Leave 6 p. m. (Santa Fe).

MONDAY—Arrive Denver, 7 a. m.

ROUTE B.

FRIDAY, AUGUST 16—Leave New York (Lehigh Valley), 9:55 a. m. Leave Philadelphia, 8:30 a. m. Leave Buffalo (Grand Trunk), 10:55 p. m.

SATURDAY—Arrive Chicago, 1:30 p. m. Leave (C. B. & Q.), 5 p. m.

SUNDAY—Arrive Denver, 7:30 p. m.

ROUTE C.

FRIDAY, AUGUST 16—Leave Boston (B. & A.), 11:30 a. m. Leave New York (N. Y. Central), 9:40 p. m. Leave Buffalo (L. S. & M. S.), 10:35 p. m.

SATURDAY—Arrive Chicago, 12:50 p. m.

FRIDAY, AUGUST 16—Leave Philadelphia (Penn.), 7:02 p. m. Leave Washington (Penn.), 6:45 p. m. Leave Baltimore, 7:52 p. m.

SATURDAY—Arrive Chicago, 2 p. m. Leave Chicago (C. B. & Q.), 5 p. m.

SUNDAY—Arrive Denver, 7:30 p. m.

Members may leave New York on a later train than that named, either on the N. Y. Central or Pennsylvania road, scheduled to arrive in time to connect with the C. B. & Q. train scheduled under Route C by paying an extra fare between New York and Chicago.

(Committeemen will please insert here their individual recommendations as to best routes and schedules.)

FROM THE PACIFIC COAST.

The Trans-Continental Passenger Association has made an excursion rate to Denver of $55 from California common points, from Bellingham, Everett, Spokane, Seattle and Tacoma, Washington, New Westminster, Vancouver and Victoria, B. C., and Portland, Oregon. Local fare must be paid to reach these common points. On arbitrary routes, going one way and returning by another, additional fare will be charged, details of which can be had from local ticket agents.

These tickets will be placed on sale at California points on August 14, 15 and 16 and Northern Pacific Coast points on August 14, 15 and 16. These tickets must be validated at Denver on the day on which the return journey begins. Otherwise they will not be accepted.

Pacific Coast members should confer with Charles E. Whilden, 1727 Pine street, San Francisco, with a view to arranging for a special party.

EXCURSIONS AFTER THE MEETING.

Many members will, no doubt, take advantage of this occasion to see something of the scenery of the Rocky Mountains and possibly of the Yellowstone Park. A cheaper rate can be obtained for such excursions by buying the ticket at the point of departure.

THE CIRCLE TRIP.

The Circle trip gives four days in the Colorado Mountains, affording a view of the most striking features in that section of the Rockies. On this trip the members travel by day only, stopping each night at a hotel. The fare is $28 for the round trip, or in parties of ten or over $20.80.

THE SALT LAKE TRIP.

The Salt Lake trip takes in the Royal Gorge of the Arkansas, the Tennessee Pass, and carries the traveler through Leadville, Grand Junction, and across the Utah desert to Great Salt Lake and return.

THE YELLOWSTONE PARK TRIP.

The Yellowstone Park trip includes the Salt Lake trip. The figures given for the other routes include fare only. For the Yellowstone Park trip the fare only is given up to the Park entrance, but the stage fare and the hotel bills in the Park are also included.

A TRIP TO THE PACIFIC COAST.

Eastern members who may desire to take this occasion to visit the Pacific Coast can do so at a slightly increased expense. Below the fare is given by way of Denver and Salt Lake City. A visit to the Yellowstone Park may be made on this trip at an additional cost of $55.50, this latter sum covering meals and four nights' lodgings in the Park, as well as fare from Salt Lake City to the Park.

SLEEPER FARES.

The sleeper fares are based on lower berth rate. On upper berths a discount of 20 per cent. is allowed. The sleeper fares given are, in some instances, approximate only.

RAILROAD AND SLEEPER FARES FOR ROUND TRIP TO DENVER.

	To Denver Only		Including Salt Lake	
	Fare	Sleeper	Fare	Sleeper
Boston	$70.80		$83.80	
New York..	67.80	$22.00	80.80	
Baltimore ...	62.80		75.80	
Philadelphia	65.55		78.55	
Cincinnati ..				
Cleveland ...				
Chicago	30.00	12.00		
St. Louis....	25.00	11.00		
Atlanta				
New Orleans				
San Fran....	55.00			

	Including Yellowstone		Including San Francisco	
	Fare	Sleeper	Fare	Sleeper
Boston $131.80			$113.30	
New York...	128.55			
Baltimore ...	123.55		105.30	
Philadelphia	126.30		108.05	
Cincinnati ..				
Cleveland ...				
Chicago	90.75			
St. Louis....	88.25			
Atlanta				
New Orleans				
San Fran....				

A PERSONALLY CONDUCTED TOUR.

The Gillespie-Kinports Company, of New York, a reliable and experienced tourists' agency, has offered to arrange a personally conducted tour from the East to Denver and Yellowstone Park on which members would be relieved of all the cares of travel by a special conductor. Members on this tour could go out as outlined above in Route C, but would return from Yellowstone Park by way of St. Paul and Duluth, traveling from Duluth to Buffalo by steamer through the Great Lakes ,arriving back at New York on September 7.

The cost of this personally conducted tour will be $220, which covers all the following expenses: Railroad, steamship and Pullman fare for the round trip, all expenses in Yellowstone Park, including stage, hotels, etc., transfers, the Central Park auto trip, at Colorado Springs, and trip through Garden of Gods, trolley trip, Salt Lake and Minneapolis. In fact, all expenses except meals en route; as these are served a la carte on all roads it is difficult to include same. At the Antlers, Colorado Springs, simply lodging is included, as the hotel is on the European plan, nor does this rate include the stay in Denver.

LOCAL TRAIN ARRANGEMENTS.

When the routes have finally been decided on further information can be obtained regarding the departure of trains from any particular point from the nearest member of the Committee on Transportation, whose names are given below:

Atlanta, Ga.—W. S. Elkin, Jr., Peachtree and Marietta streets.

Baltimore, Md.—Charles Caspari, Jr., University of Maryland.

Boston, Mass.—C. Herbert Packard, 7 Central Square.

Chicago, Ill.—Wilhelm Bodemann, Hyde Park.

Cincinnati, O.—Charles G. Merrell, 5th and Butler streets.

Cleveland, O.—L. C. Hopp, 1104 Euclid avenue.

Denver, Col.—W. A. Hover, 1437 Lawrence street.

Minneapolis, Minn.—F. J. Wulling, Minnesota University.

San Francisco, Cal.—Charles W. Whilden, 1727 Pine street.

St. Louis, Mo.—H. M. Whelpley, 2342 Albion Place.

New York—Caswell A. Mayo, 66 West Broadway, *Chairman.*

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CONFERENCE AND HEARING ON THE RICHARDSON BILL.

The recent Washington Conference of A. Ph. A. and N. A. R. D. representatives and the hearing before the congressional committee having the Richardson Bill in charge, seem to have been fruitful of good results. A statement in behalf of the two Associations was made by Frank H. Freericks, Esq., of Cincinnati, Ohio, which was a lucid explanation of the general sentiment of the retail drug trade upon the provisions of the bill. In substance Mr. Freericks stated that the retail druggists of the country were not interested in the bill from the viewpoint of self-interest, but from the viewpoint of the public interest and welfare. The retail drug trade is not disposed to say that every proprietary medicine is bad. There are proprietary remedies which are of value, but so far as the Associations are concerned, they are vitally interested in preventing the sale of medicines which are fraudulent, or habit-forming.

Referring to Section 7 of the bill which reads as follows:

"If, when a drug recognized in the U. S. Pharmacopœia or National Formulary is sold under or by *any* name which differs from the standard of strength, quality or purity as determined by the test laid down in the U. S. Pharmacopœia or National Formulary official at the time of investigation," he called attention to the fact the bill seeks to replace "A" in the present law with the word *"any,"* and to change the place in which the U. S. P. and N. F. are mentioned, so that the effect would be to bring any preparation, no matter by what name sold, within its provisions.

He said the trade favored a change of Section 7 of the present law, which permits a deviation from the official standard of strength or quality provided it be set out on the label, for the reason that the laity and physicians generally were not sufficiently acquainted with U. S. P .and N. F. standards to understand the extent of such deviations. For example, a label "Tincture of Opium, 5 per cent.," would mean nothing to the person who did not know that the official standard was 10 per cent.

There are cases, however, in which a variation from the official standards should be permitted. As for example, when formulas had been improved so as to furnish a really better article than the U. S. P. or N. F. formula. If no variation is permitted, then such an improved product can not be marketed. Such products should be permitted to be sold, provided they are not sold under an official title, or provided the title is so qualified by accompanying statements as to show clearly that it is not sold as being of official strength and quality.

He also referred to the use of crude drugs and chemicals employed in manufacturing which could not be sold under any name without incurring the penalty for misbranding, in case the clause was enacted as printed in the bill. For this reason he believed that Section 7 of the present act which reads, "Provided that no drug defined in the U. S. Pharmacopœia or National Formulary shall be deemed to be adulterated under this provision if the standard of strength, quality or purity be plainly stated upon the bottle, box or other container thereof, although the standard may differ from that determined by the tests laid down in the U. S. Pharmacopœia or National Formulary," should be retained, and supplemented by an additional provision reading as follows: "Provided that nothing herein contained shall prohibit the sale of drugs or chemicals in their crude form when labelled "for technical purposes," "not for medicinal use.'

By making this latter addition, the public would be safeguarded against drugs of improper strength and purity, while the use of such articles for manufacturing purposes would not be interfered with.

Referring to the clause which reads, "Third, if it contains any methyl alcohol or wood alcohol," he stated that the Associations were opposed to the use of wood alcohol in any medicinal preparation, whether for internal or external use, but felt that the provision as it now stood might operate to prevent its use in the arts for purely technical purposes, and suggested that the provision be suplemented by adding, "but this shall not prevent the sale of methyl or wood alcohol for use in the arts when sold under the name wood naptha poison."

Concerning that portion of Section 7 which reads:

"That no cosmetic, hair preparation or hair dye or preparation containing any poison or deleterious ingredient," he argued that the language was too general and too indefinite, and that the particular substances or classes of substances should be specifically stated, since what might be considered injurious or deleterious by one person might not be so considered by reasonable persons generally. Almost any substance may be injurious or deleterious under certain circumstances and, consequently, there is room for great differences of opinion. By enumerating a list of substances which could not be employed without naming them on the label, such opportunities for dispute would be avoided.

He did not agree with those who contended that the sale of habit-forming drugs should be left exclusively to State regulation, since the States are powerless to regulate those transported in interstate commerce. As long as it would be possible for a man in Michigan to ship cocaine into Ohio, the latter State would be unable to control the traffic.

He also objected to the clause of the bill which related to the sale of drugs "direct to the consumer or laity which contains any habit-forming or deleterious ingredients," as also being too general and indefinite, and believed that this should be substituted by naming the substances which are to be considered as habit-forming or deleterious.

He also argued that packages in interstate commerce should be marked to show that their contents had been prepared by properly qualified persons, or by or under the supervision of a registered pharmacist. His argument also covered the sale of proprietaries containing narcotic and habit-forming drugs, and he contended that the presence of opium or its alkaloids in very small proportions, as in paregoric or brown mixture should not operate to bring such preparation within the limits of the law.

He said that the drug trade as a whole was heartily in favor of the strongest measures for the control of the entry into interstate commerce of habit-forming drugs, but that the regulations should not be burdened with unnecessary details, and he was inclined to believe that this subject could be better dealt with in a separate legislative measure than as a part of the Food and Drugs Act.

In conclusion, he submitted on behalf of the conference committee certain propositions to amend Sections 6, 7 and 8 of the Richardson Bill so that it shall read as follows:

"Section 6. That the term 'drug' as used in this Act shall include all medicines and preparations recognized in the United States Pharmacopœia or National Formulary for internal or external use, and any substance or mixture of substances, or device, intended to be used for the cure, mitigation, or prevention of disease of either man or other animals; also soda and potash lye; also cosmetics, hair preparations and dyes, and toilet preparations; abortifacients, remedies for drug addiction, alcoholism, debility, obesity, and antilean; also tobacco, snuffs, tobacco substitutes, and all tobacco products. The term 'food' as used herein shall include all articles used as food, drink, confectionery, or condiment by man or other animals, whether simple, mixed, or compound."

"Section 7. That for the purposes of this Act an article shall be deemed to be adulterated—

"In the case of drugs—

"First. If, when a drug is sold under or by a name recognized in the United States Pharmacopœia or National Formulary, it differs from the standard of strength, quality or purity, as determined by the test laid down in the United States Parmacopœia or National Formulary, official at the time of investigation: Provided that nothing herein contained shall prohibit the sale of drugs and chemicals, in their crude form, when labelled both "For Technical Purposes," "Not for Medicinal Use."

"Second. If its strength or purity fall below the professed standard of quality, under which it is sold."

"Third. If it contain any methyl alcohol or wood alcohol, but this shall not prevent the sale of methyl or wood alcohol for use in the arts, when sold under the name 'wood naptha' 'Poison.'

"Fourth. If tobacco, snuff, or tobacco products contain any added poisonous or deleterious ingredient which may render such article injurious to health: or if any substance has been mixed or packed with these products so as to reduce or lower or injuriously affect their quality or strength; or if, any substance has been substituted in whole or in part for

the articles; or if they be mixed, colored, powdered, coated, or stained in any way whereby damage or inferiority is concealed; or if they consist in whole or in part of filthy, decomposed, or putrid animal or vegetable matter."

"Section 8. That the term "misbranded" as used herein shall apply to all drugs or articles of food or articles which enter into the composition of food or drugs, the package or label of which shall bear any statement, design ,or device, regarding such article, or the ingredients or substances contained therein, which shall be false or misleading in any particular; or if it be a drug. (excepting brandy, gin, whisky, or wine) when offered for sale, barter or exchange from any state, territory, or the District of Columbia, into any other state, territory or the District of Columbia, which contains any of the following ingredients, towit: acetanilid, antipyrin, acetphenetidin, anesthesin, alcohol, aspirin, alpha and beta eucain, arsenic, carbolic acid, chloroform, chloral, cocain, croton oil, cannabis, heroin, holocain, lead salts, morphin, mercury salts, except calomel, novocain, opium, orthoform, phenacetin, theobromin, trional, sulphonal, stovain, strychnine, veronal, cotton root, ergot, pennyroyal, rue, savin, tansy, or any compound or preparation or derivatives of any of the foregoing, unless it is marked to show that it has been manufactured or compounded by or under the personal supervision of a pharmacist legally registered or licensed as such in the State, Territory or District where manufactured or compounded, or when offered for sale directly to the consumer, unless it is marked to show, that it is being sold by or under the direct supervision of a physician or pharmacist legally registered as such in the State, Territory or District, where it is offered for sale; or if the label or labels or any advertisement, poster, circular, catalogue, price list, or other means of publicity, contain any false or misleading claims or representations, relative to disease or symptoms of disease; or if any false statement of any fact concerning its curative or remedial property be made or promulgated in any manner; or if, (except in the case of bona fide prescriptions of licensed practitioners of medicine or dental surgery and veterinary surgeons, in the course of their personal practice) the package fail to bear a statement on the label of the quantity or proportion of any of the following ingredients, towit, acetanilid, antipyrin, acetphenetidin, anesthesin, alcohol, aspirin, alpha and beta eucain, arsenic, carbolic acid, chloroform, chloral, cocaine, croton oil, cannabis, heroin, holocain, lead salts, morphin, mercury salts except calomel, novocain, opium, orthoform, phenacetin, trional stovain, strychnine. sulphonal, veronal, cotton root, ergot, pennyroyal, rue, savin, tansy, or any compound or preparation or derivative of any of the foregoing; and to any food or drug product which is falsely branded as to the State, Territory, or country in which it is manufactured or produced.

Matters of General Interest

THE MAIL-ORDER DOCTOR.

L. E. SAYRE,
Dean, School of Pharmacy, University of Kansas.

The writer is constantly receiving letters which bring to his notice the various problems, connected with the practice of legitimate pharmacy by pharmacists on the one hand, and, on the other, the legitimate practice of medicine by physicians. Not least among these problems is how to deal with what seems to be a purely business enterprise, showing itself in a certain form of practice of medicine that may perhaps be best designated as "mail-order practice." Circulars and circular letters, typewritten, written in script and in all possible attractive forms of communication, serve the public, through the mails, with all kinds of medical literature, and through this medium, large amounts of medicines, sometimes of a poisonous character, reach the homes of numerous families. These letters adroitly call the attention of the "Dear Madam" or the "Dear Mr. So and So" or even the "Dear Doctor" to phenomenal "discoveries" in therapeutics. One of these personal letters is now before me. From it I quote:

"My Dear Patient:

"Your statement of conditions is to hand. An earnest examination of it convinces me that both of us have reason for satisfaction. Yours has been a very stubborn case. You have suffered this way for a long time. It cannot be expected that such suffering as you have undergone can be banished in a few days. Your general health is now, no doubt, vastly improved. A few minor points aside, you are in every way better today than you were a month ago. You have suffered so much and so long that you can scarcely realize your improvement. It is often so with sick people. I have treated many in my time. I have watched your case since commencement. I speak, therefore, from a knowledge of the subject, etc., etc."

The patient to whom this affectionate epistle was addressed was found one afternoon unconscious under the influence of a very powerful narcotic which led to a request for an investigation of the medicine he had been taking. The same had been sent by one of these mail-order physicians. The results of

this investigation will be handed to the victim and to his friends.

Another one of these typical epistles I have before me.

"Mr. ————. We are sending you a sample package of the remarkable discovery for ————.

We say that it is a wonderful remedy for the simple reason that it actually does the work, gives instant relief and cures ————. Something that you have undoubtedly hunted for in vain ever since you became afflicted.

The trial treatment we are sending you is going to prove it. It is going to prove it in your particular case, if you follow the directions for its use

We consider your search for a cure is now finally at an end.

No longer will it be necessary for you to leave home and friends behind and fly away to some other climate, to the mountains or seashore, undergoing heavy expense and waste of precious time from your work.

Just keep right on with your daily work and pleasure as usual.

By using this exceptional remedy you save money, spent in useless treatments of various kinds. You save time besides, etc., etc."

The above is another example of a personal communication, by mail, sent us by a patient, of a "mail-order physician."

In a circular which has been sent out to the pharmacists of Kansas, as the Chairman of the Committee on Drug Reform of the American Pharmaceutical Association, I have endeavored to bring before the profession of pharmacy some of the evils close at hand which relate to the loop-holes in the execution of the drug end of the Food and Drugs Law. These loop-holes are connected with the dispensing doctor, itinerant vendor and now we have a far more subtle problem, the control of the so-called mail-order doctor, who can dispense, apparently, all kinds of remedial agents, including narcotic poisons, and be absolutely independent of the provisions of the Food and Drugs Law. This problem, relating to the irregular practice of medicine and pharmacy and bringing them into proper control for the welfare of the public, is a huge problem and what is needed first on the part of the pharmacists, who should take an interest in it, is an *awakening* so that the exact conditions, which are now existing, can be plainly seen and felt. Some of the correspondents who have addressed the writer as Chairman of the Committee on Drug Reform concerning this agitation, do not seem to feel as keenly as others the gravity of the situation. They wish to minimize its seriousness and are inclined to the opinion that an agitation, in this direction indicated, borders on fanaticism. But the majority of those who have considered it soberly, believe as one of the most eminent pharmacists in the country has written:

"I feel sure that you are making no mistake in this agitation, bearing upon drug reform, and I am sure that, as regarding all essentials in the matters you are bringing out, we shall find that we view the subject alike."

The question might be asked, "What can be accomplished by such an agitation without a well-thought-out plan for future action?" I have replied to such questions as these: Because one has not a clearly, well-thought-out plan from beginning to end is no reason why a start should not be made, if this is made in the right direction. One step at a time is all that one can expect to make. After the first step is made, the right second step and third, and so on, to the end may appear more and more plain as one advances. Perhaps it may be found that our present law can reach and properly control such practice. If not, a statutory law covering the case is possible—it is worthy to strive for.

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THE AMERICAN DRUGGISTS' FIRE INS. CO.

The regular quarterly meeting of the Executive Board of the American Druggists' Fire Insurance Co. was held at Cincinnati, on April 26th and 27th, Messrs. Avery, Beal, Kauffman, Heinritz, Rothwell, Zwick and Freericks, being present.

The Executive Board devoted much of its time to the carrying out of the orders given at the stockholders' and directors' meetings in January. During the first three months of the year it was shown that the company had written insurance amounting to $2,560,730.21, which after allowing a 25 per cent. reduction, was at a premium charge of $27,034.79. The total business in force on the first day of April amounted to $8,501,169.90, at a premium of $88,627.83. The increase in business for the first three months of the year over the first three months of last year amounted to $569,996.88 at a premium increase of $5,070.46. The re-insurance reserve of the company during that time was increased by $2,055.60.

During the first quarter the company saved its policyholders the sum of $6,011.59, which

said amount was retained by its policyholders. The net losses for the first three months of the year amounted to $21,279.18.

The Executive Board authorized an additional investment in securities to cover the increase in re-insurance reserve.

The continued splendid growth of the company's business was a source of satisfaction. Arrangements were made to give special attention to those states from which a larger volume of business should be expected. The great fire waste and loss throughout the country during the winter season fully sustains the frequently announced position of the Executive Board, that the druggists of the country should be careful in carrying their insurance in companies having sufficient capital and assets and that are thus provided for every emergency, and in this connection it is requested that the drug trade of the country always have in mind that the American Druggists' Fire Insurance Company is the only Capital Stock Druggists' Fire Insurance Company in existence.

Communications and Correspondence

All communications must be signed by their Authors

TO THE MEMBERS OF THE COMMITTEE ON DRUG REFORM AND OTHERS WHO ARE INTERESTED IN THE COMMITTEE'S WORK.

The Chairman of this Committee wishes to ask its members and all those who are interested in the work of the Committee to write the Chairman of the above Committee and reply to questions which are herewith submitted. The Chairman of the Committee has circularized the State of Kansas and will make a report of his findings at the State Association meeting. He begs others who are interested to do the same for their particular State, so that at the coming meeting of the A. Ph. A. statistics may be furnished of interest and value.

1. Do physicians of your acquaintance dispense their own medicines?

2. Do they buy full standard preparations and drugs, or mainly proprietary remedies?

3. Are their goods inspected as in drug stores?

NOTE: That the public is served unwittingly by two standards is apparent to every one when the law fails to provide for an inspection of the physician's drug stock. It is true that physicians may invite such inspection, but it is our desire to know how many physicians voluntarily give such an invitation.

4. From what houses do they buy?

5. What sized stocks do they carry?

6. To what extent are doctors selling drugs and medicines on a call not actually prescribed by them?

7. Would your doctors prefer to dispense or prescribe?

8. What steps would you advise for the betterment of the aforesaid conditions?

9. Are your doctors in favor or opposed to the standardization law ?

10. How are the physicians and druggists observing the spirit of the anti-narcotic law? Is the complaint of the former abusing their rights, and of the latter, who are legally restricted, dispensing morphine, cocaine and narcotics to habitues, true?

11. To what extent are drugs and medicines sold in your town by mail order houses and through clubs offering premiums?

12. Do other stores ever carry medicinal preparations of any kind? If so, what kind?

L. E. SAYRE,
Librarian of Kansas Pharm. Association; Chairman of Committee on Drug Reform of the American Pharmacy Association.

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BULLETIN No. 1 OF THE SECTION ON HISTORICAL PHARMACY.

Our great A. Ph. A. has now reached an age of three score, and its youngest offspring, the Historical Section, should do its full share to present the mother with valuable contributions at the Denver meeting. The members are asked to submit papers, letters, photos, books, etc., on historical subjects. Especially the Western members are earnestly requested to present papers on the development of pharmacy in the Western United States, in order to make such history available to future generations.

Let the Western pioneers of pharmacy become active and present a record of this history at Denver!

Let the "forty-niners" tell us of the early

history of pharmacy in California, and bring these golden nuggets to the Convention!

Let us all work so as to make the Denver meeting one that will long be remembered in the history of the A. Ph. A.!

Sincerely yours,

OTTO RAUBENHEIMER, Chairman.
EDWARD KREMERS, Historian.
CASWELL A. MAYO, Secretary.

Brooklyn, N. Y., May 15, 1912.

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SECTION ON PRACTICAL PHARMACY AND DISPENSING.

Bulletin No. 3.

As the time for our Denver meeting approaches, the Committee on Practical Pharmacy and Dispensing is exceedingly anxious to secure as many contributions as possible for this occasion in order that we may have a wide variety of topics to discuss and digest. Heretofore we have been most fortunate in arranging very interesting programs for our meetings, but this year the Committee is aiming to excel all previous performances—if that is possible. If each member should assume but a small portion of his responsibility, this would be very easy of accomplishment. We hope to make an impression on our Western friends that will not soon be forgotten.

All members, whether new or old, are eligible as contributors, and it is hoped that we may have the pleasure of receiving original papers from many original sources for this meeting. Fraternally yours,

P. HENRY UTECH, Chairman.
J. LEON LASCOFF, Secretary.

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SOLUTION OF MAGNESIUM CITRATE.

If the camel's back will stand one more straw, may I add my formula and process for Solution of Magnesium Citrate to those given in the A. Ph. A. for May. I have been using it for twenty-five years and it possesses the charm of being quickly and easily prepared, requires no heating of bottles to sterilize them, and the preparation if properly stoppered seems to keep indefinitely. I prepare it for the trade in lots of ¼ dozen to ½ gross at a time, and have never had a complaint of its spoiling either from precipitation or from fungus growth. The longest test I have given it, was from last August to February. A dozen was shipped the first part of August to a customer who ordered it in patent-stoppered bottles and by mistake the cork-stoppered were shipped. He was requested to send these back, but in the meantime he had sold four of these, returning only eight. Part of these were subsequently sent out on orders, but one bottle in some way was left over and set around in the laboratory until in February. Feeling the need of a purgative, I took about three-quarters of this bottle and found it as active as if freshly prepared.

I have frequently kept it two or three months at a time in perfect condition. My formula for one dozen is:

Citric Acid.....	10 oz. (Troy) 96 grains
Magnesium Carb.	5 oz. (Troy)
Sugar	24 oz. (Troy)
Oil of Lemon...	24 drops

The Citric Acid, Boiling Distilled Water, q. s., and Magnesium Carbonate are put in a mortar and rubbed well together, and 2000 cc. hot water gradually added with constant trituration. As soon as the acid and magnesium carbonate are dissolved and the solution is clear, it is filtered through a wetted filter into the sugar, to which the oil of lemon has been previously added and the whole stirred until the sugar is dissolved. The liquid is then made up to 3000 cc. with distilled water and 250 cc. of this solution put in each bottle. The bottles are then filled to the shoulder with distilled water, 38 grains of potassium bicarbonate in crystals added to each bottle which is well stoppered and laid on its side in a cool place. I always use Jennings' magnesium carbonate in 2 oz. blocks and the potassium bicarbonate in crystals.

It makes a nicer looking preparation if the sugar and oil are dissolved before filtering, but it does not filter so rapidly.

You will observe that I have mixed my weights and measures. This was done for convenience.

Each bottle contains:

Citric Acid	408 grains
Magnesium Carb.	200 grains
Sugar	2 ounces, Troy
Oil of Lemon.....	2 gtts.
Potassium Bicarb.	38 grs.
Dist. Water	q. s.

J. O. BURGE, Ph. G.

Council Business

COUNCIL LETTER No. 19.

PHILADELPHIA, April 30, 1912.

Members of the Council:

Motions No. 35 (Application for Formation of Saint Louis Branch, A. Ph. A.) and *No. 36 (Approval of Report of Committee on Publication)* have each received a majority of affirmative votes.

While voting in favor of Motion No. 36, Otto Raubenheimer objects to the decision of the Committee on Publication to furnish reprints of articles in the JOURNAL to authors *at cost*, urging that they be furnished *gratis*, upon request. Mr. Raubenheimer's objection has been referred to the Committee on Publication by whom it is now being considered.

In connection with vote on Motion No. 36, P. Henry Utech writes:

"In approving Motion No. 36, allow me to suggest that I heartily endorse the clause which urges immediate publication of the "Year Book." This book will in a way replace our former annual volume and will be eagerly looked for by a large number of our members who perhaps have not as yet become aware of the new form of our Proceedings. Should this "Year Book" be published simultaneously with the new National Formulary, I fear the delay will cause considerable confusion and embarrassment. Much time and a large amount of painstaking work yet remains to be done before our revised Formulary will be in readiness for publication, and it is the part of wisdom to proceed slowly and cautiously with the work to the end that we may have a more perfect product to offer our fellow-workers."

Edward Kremers votes in favor of Motion No. 36, and writes that:

"I desire to move at the same time that the Council reconsider, at the Denver Meeting, the question of publishing the Report on the Progress of Pharmacy as a separate volume, and to add the money thus saved to the JOURNAL, which could just as well publish the abstracts and do this at a much earlier date. The Reporter on the Progress of Pharmacy could be added to the editorial staff of the JOURNAL.

Is this motion seconded?

It should be stated that at the Boston (1911) meeting of the Council, held August 17, the subject of journalizing the Report on the Progress of Pharmacy was very carefully considered, but the consensus of opinion was that the Report should be issued separately as a yearly volume; and this was decided upon, and the by-laws so amended.

Motion No. 37 (Appropriation of $50 for binding, etc., of Proceedings). Moved by J. A. Koch, seconded by J. H. Beal, that an appropriation of $50 be made to cover expenses of binding and shipment of Proceedings in stock.

The appropriation is approved by the Finance Committee.

Motion No. 38 (Election of Members). You are requested to vote on the following applications for membership:

No. 195. Lester Raymond Tyson, Mo. Pac. Hospital, 1600 California Ave., St. Louis, Mo., rec. by H. M. Whelpley and J. W. Mackelden.

No. 196. Josiah Feller Wagner, Garden City, S. Dakota, rec. by Wm. B. Day and J. W. England.

No. 197. William Sydnor Bragg, Jr., Troy, Mo., rec. by W. A. Hickey and H. M. Whelpley.

No. 198. F. D. Garnett Walker, 331 20th St., Rock Island, Ill., rec. by Charles Moline and George W. Sohrbeck.

No. 199. George William Evans, Anderson, S. C., rec. by Wm. B. Day and J. W. England.

No. 200. Solomon A. Eckstein, 112 Wisconsin St., Milwaukee, Wis., rec. by Wm. B. Day and J. W. England.

No. 201. Paul W. Smith, 4836 Delmar Blvd., St. Louis, Mo., rec. by Wm. K. Ilhardt and H. M. Whelpley.

No. 202. Albert Guy, 4836 Delmar Blvd., St. Louis, Mo., rec. by Wm. K. Ilhardt and H. M. Whelpley.

No. 203. Herman J. Holthoefer, 5030 Prairie Ave., Chicago, Ill., rec. by J. H. Wells and W. B. Day.

No. 204. Myron Nile Ford, 235 N. Main St., Delphos, Ohio, rec. by J. H. Beal and W. A. Pearson.

No. 205. Milton Theis Esterly, Sergt 1st Cl. Hosp. Corps. U. S. A., Fort Mason, San Francisco, Cal., rec. by C. L. Brown and Wm. B. Day.

No. 206. John Henry Closson, 1209 7th Ave., West, Seattle, Wash., rec. by Chas. W. Johnson and A. H. Dewey.

No. 207. Schuyler Van Rennsselaer Gross, 315 West Geyser St., Livingston, Montana, rec. by W. B. Day and E. N. Gathercoal.

No. 208. Clifford Henry Perry, Sergeant, Hospital Corps, Fort Andrews, Mass., rec. by Glen D. Gorton and Wm. B. Day.

No. 209. Herbert C. Hamilton, care Parke, Davis & Co., Detroit, Mich., rec. by E. M. Houghton and Harry B. Mason.

No. 210. George Washington Francis Boyd, 121 2d St., N. E., Washington, D. C., rec. by George Washington Boyd and Lewis Flemer.

No. 211. Oliver Atkins Farwell, 449 McClellan Ave., Detroit, Mich., rec. by J. H. Beal and Harry B. Mason.

No. 212. Joseph Mark Taber, care Elko County Hospital, Elko, Nevada, rec. by W. B. Day and J. W. England.

No. 213. George L. Parsons, Milton, Ia., rec. by George A. Kiedaisch and Willis J. Teeters.

No. 214. Bolivar Jurador, Panama City, Panama, rec. by Albert Schneider and H. M. Whelpley.

The Committee on Revision of the Constitution and By-Laws of the Association is actively engaged in its task. Simplicity and increased efficiency in the management of the Association is desired, and the members of the Council are requested to send suggestions for amendments to the Chairman of the Committee, J. W. England, as soon as possible.

J. W. ENGLAND,
Secretary of the Council.

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COUNCIL LETTER No. 20.

PHILADELPHIA, May 21, 1912.

Members of the Council:

Motions No. 37 (*Appropriation of* $50 *for binding, etc., of Proceedings*), *and No.* 38 (*Election of Applicants for Membership from Nos.* 195 *to* 214, *inclusive*) have each received a majority of affirmative votes.

The following communication has been received from Charles H. LaWall, Secretary of the Scientific Section:

"As I will not be able to be present at the annual meeting of the A. Ph. A. at Denver this year, I would like the Council to appoint a temporary secretary in accordance with the by-laws adopted by the Scientific Section at the Boston meeting which read: "In case the Secretary is unable to attend the annual meeting he shall notify the Council to that effect and the Council shall then appoint a temporary secretary."

Motion No. 39 (*Temporary Secretary of Scientific Section*). Moved by G. M. Beringer, seconded by J. W. England, that the Council appoint Freeman P. Stroup, of Philadelphia, as Temporary Secretary of the Scientific Section, to take the place of Charles H. LaWall, Secretary.

The General Secretary announces that the Record Book used for the registration of members in attendance at the annual conventions was completely filled at Boston. The book constitutes a part of the permanent records of the Association, and has to be specially printed and bound.

Motion No. 40 (*New Record Book*). Moved by J. H. Beal, seconded by J. W. England, that the General Secretary be authorized to have a new record book prepared in time for the Denver Convention, and that there be appropriated a sum not exceeding $25 for this purpose.

This motion has been approved by the Chairman of the Finance Committee.

Motion No. 41 (*Journalizing the Report on the Progress of Pharmacy*). Moved by Edward Kremers, seconded by A. H. Clark, that the Council reconsider at the Denver Meeting, the question of publishing the Report on the Progress of Pharmacy as a separate volume, and to add the money thus saved to the JOURNAL, which could just as well publish the abstracts and do this at a much earlier date. The Reporter on the Progress of Pharmacy could be added to the Editorial Staff of the JOURNAL.

The following Tentative Program for the Sixtieth Annual Meeting of the Association, at Denver, August 19-24, 1912, is submitted by the General Secretary, Secretary of the Council and Local Secretary.

TENTATIVE PROGRAM FOR THE SIXTIETH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Denver, Col., August 19-24, 1912.
(*Headquarters, Brown Palace Hotel*)

Monday, August 19—
9:00 A. M. Meeting of the Council.
10:30 A. M. Meeting of the National Association of Boards of Pharmacy.
3:00 P. M. First General Session.
(The Nominating Committee will meet immediately after the adjournment of the First General Session.)
9:00 P. M. President's Reception.

Tuesday, August 20—
9:00 A. M. Meeting of the Council.
10:00 A. M. Second General Session.
3:00 P. M. Section on Commercial Interests.
8:00 P. M. Section on Commercial Interests (second Session).
8:00 P. M. Meeting of the Conference of Pharmaceutical Faculties.

Wednesday, August 21—
9:00 A. M. Meeting of the Council.
10:00 A. M. Section on Education and Legislation.
3:00 P. M. Section on Practical Pharmacy and Dispensing.
3:00 P. M. Section on Education and Legislation (second Session).
6:30 P. M. Separate Reunions of College Alumni.
9:30 P. M. Smoker.

Thursday, August 22—
9:00 A. M. Meeting of the Council. (Organization of the Council for 1912-13.)

10:00 A. M. Section on Scientific Papers.
3:00 P. M. Section on Scientific Papers (second session).
8:00 P. M. Section on Practical Pharmacy and Dispensing (second Session).
8:00 P. M. Joint Session of Boards of Pharmacy and Section on Education and Legislation.

Friday, August 23—
8:00 A. M. Mountain Excursion to Glacier Lake; visiting en route the University of Colorado, and Boulder. Chautaqua Entertainment by the citizens of Boulder. Returning to Denver at 6 p. m.
8:00 P. M. Section on Historical Pharmacy.

Saturday, August 24—
9:00 A. M. Meeting of the Council.
10:00 A. M. Final General Session.

In arranging the above program it has been sought, as far as possible, to have the first session of each Section or Society at a time when no other meeting is in progress. When the time allotted is not sufficient for the completion of the work, it is presumed that the Section or Society will arrange for adjourned meetings at such times as will not interfere with other portions of the general program.

Comments on the above program and motions for amendment should be sent to the Secretary of the Council, J. W. England, 415 N. 33d St., Philadelphia, Pa., in time for the next issue of the JOURNAL.

PROGRAM OF SPECIAL ENTERTAINMENTS FOR LADIES ATTENDING THE SIXTIETH ANNUAL CONVENTION.

In addition to the entertainments of the general program printed above, the Local Committee has arranged for the following special excursions and entertainments for the ladies in attendance:

Tuesday, August 20—
9:00 A. M. Fifty mile trolley ride, visiting the foothills about Denver.
8:00 P. M. Concert and moving pictures by E. C. Fine, of Boulder.

Wednesday, August 21—
9:00 A. M. Seeing Denver in Automobiles.
2:00 P. M. Matinee at Elitch's Gardens.
Battle of the Monitor and Merrimac.
Zoological Gardens.
8:00 P. M. Toast Banquet tendered by the ladies of the Denver State Pharmaceutical Association.

Thursday, August 22—
9:00 A. M. Autos.
3:00 P. M. Card Party at Brown Palace.

Saturday, August 24—
Auf Wiedersehn—Au Revoir—Adios.

Do you approve above Tentative Program? This will be regarded as *Motion No.* 42 (*Approval of Tentative Program for* 1912 *Annual Meeting*).

Motion No. 43 (*Election of Members*). You are requested to vote on the following applications for membership:

No. 215. Isaiah Benjamin Miller, 5 and 7 Main St., Cape Girardeau, Mo., rec. by H. M. Whelpley and Wm. B. Day.

No. 216. Albert C. Crawford, Leland Stanford Junior University, Stanford University, Cal., rec. by J. W. England and W. A. Pearson.

No. 217. Joseph F. Shreve, Jacksonville, Ill., rec. by H. C. Christensen and James P. Crowley.

No. 218. James Clothier Sims, 1716 Murray Ave., Pittsburgh, Pa., rec. by J. A. Koch and J. S. O'Brien.

No. 219. Theodore Christian Bode, 803 F St., Salida, Col., rec. by O. L. Bresler and C. M. Ford.

No. 220. Lawrence Roscoe Marglous, 3947 Kennerley Ave., St. Louis, Mo., rec. by H. M. Whelpley and J. W. Mackelden.

No. 221. Edwin Alexander Miller, Cape Girardeau, Mo., rec. by H. M. Whelpley and J. W. Mackelden.

No. 222. Isidore A. Forster, 3129 Johnston Ave., Chicago, Ill., rec. by Wm. B. Day and E. N. Gathercoal.

No. 223. Heinrich Vennemann, Fort Snelling, Minn., rec. by Wm. B. Day and J. W. England.

No. 224. Jacob Galdstein, 1231 W. Madison St., Chicago, Ill., rec. by A. H. Clark and J. H. Beal.

No. 225. Albert Otto Zwick, M. D., 1104 East MacMillan St., Cincinnati, Ohio, rec. by J. H. Beal and Geo. B. Kauffman.

No. 226. William George Gaessler, Iowa State College Agricultural Experiment Station, Ames, Iowa, rec. by Geo. B. Kauffman and Clair A. Dye.

No. 227. George Comings Whitmore, 601 Harrison Ave., Leadville, Col., rec. by Chas. M. Ford and F. W. Nitardy.

No. 228. Gebhard B. Wagner, Butler, Pa., rec. by J. A. Koch and J. S. O'Brien.

No. 229. Charles Elmer Walley, 3886 Brighton Road, Pittsburgh, Pa., rec. by J. A. Koch and J. S. O'Brien.

No. 230. Gustav Kring, 2735 South Broadway, St. Louis, Mo., rec. by Wm. K. Ilhardt and Wm. H. Lamont.

No. 231. Joseph Young Dendy, Sergeant, Hospital Corps, U. S. Army, Camp Jossman, Guimaras, P. I., rec. by Samuel J. Harris and Frederick Randolph Williams.

No. 233. Samuel Cook, Sergeant Hospital Corps, U. S. Army, Camp Jossman, Guimaras, P. I., rec. by Samuel J. Harris and Frederick Randolph Williams.

No. 234. Thomas Joseph Szykowny, 168 41st St., Pittsburgh, Pa., rec. by J. A. Koch and Fred J. Blumenschein.

No. 235. George Nelson Rawleigh, 601 N. 6th St., Paducah, Ky., rec. by H. M. Whelpley and W. P. Overstreet.

J. W. ENGLAND,
Secretary of the Council.

Obituaries and Memorials

Persons having information of the death of members of the A. Ph. A. are requested to send the same promptly to J. W. England, 415 N. 33d St., Philadelphia, Pa. Information as to the age, activities in pharmacy, family, etc., of the deceased should be as complete as possible. When convenient a cabinet photograph should accompany data.

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GUSTAVUS RAMSPERGER.

Gustavus Ramsperger, the dean of German pharmacists in this country, is at rest, after a life full of years of usefulness and honor. He met his death by falling from the window of his apartment in Central Park West in New York, on May 6th.

Mr. Ramsperger was born in Germany in 1834, and was educated as a pharmacist at the University of Tubingen. He came to this country in 1851, and purchased the drug store at 62 Oliver street, which he had for sixteen years. In 1867 he became a partner in the Faber-Balluff store at the corner of Thirty-eighth street and Sixth avenue, and in 1873, sold out his interest, and in 1875 re-entered the business in Brooklyn; and in 1884 sold this store to his nephew. Since then he has not been actively identified with business, but has traveled widely.

Mr. Ramsperger founded the German Apothecaries Society of New York sixty years ago, and was honorary vice-president of it at the time of his death; and was, also, honorary vice-president of the New York College of Pharmacy, of which he was one of the founders. He was a life member of the American Pharmaceutical Association, which he joined in 1860.

He was unusually well-informed in matters pharmaceutical, and took a deep interest in the New York College of Pharmacy, in the German Apothecaries Society, and in the New York Branch of the American Pharmaceutical Association.

Genial in temperament and kindly in disposition, his pleasing personality and sterling character won the love and respect of a wide circle of friends and associates.

He leaves a son and a daughter, the wife of Otto P. Amend. J. W. E.

F. Henry Parker, of Burlington, Vt., died on March 10, 1912, aged fifty-three years. He joined the American Pharmaceutical Association in 1909.—J. W. E.

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Herschell Boynton, of Biddleford, Me., died on March 20, 1912, aged sixty-three years. He has been a member of the American Pharmaceutical Association for thirty-seven years.—J. W. E.

Proceedings of the Local Branches

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—Resolution adopted at the Boston Convention, 1911.

Reports of the meetings of the Local Branches should be mailed to the editor on the day following the meeting, if possible. Minutes should be *plainly* written, or typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

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PITTSBURGH BRANCH.

The last meeting of the Pittsburgh Branch for the 1911-12 course took place Friday evening, May 10. It proved to be of unusual interest and value, and if the proceedings could have been listened to and participated in by each proprietor of a pharmacy in this district they would have been of great help to all in the conduct of their respective stores. Among the subjects covered were the duty of the druggist under the law with reference to the dispensing of poisons; the propriety of and the duty of a dispenser in the refilling of habit-forming drugs; the handling of intoxicants and sales of alcohol; the duty of the relief clerk concerning the display of his registration certificate; the attitude of the honest pharmacist toward fake proprietaries, both in his sales and his prescription department; the wisdom of preparing our own U. S. P. and N. F. preparations, from the economical as well as truthfulness-to-formula standpoint; all of the utmost value in their commercial bearing. The retail druggist who fails to

avail himself of the practical teachings of this post-graduate course, which is frequently tendered to him, loses something that can scarcely be computed from a monetary outlook, its value being beyond price.

The professional side likewise was well covered. Dr. Saalbach's paper, "Some of the Good Things of the National Formulary," will be found elsewhere in these columns; Dr. Kutscher's "Dont's in Pharmacy" was instructively interesting and full of excellent suggestions concerning the things not to do, and was greatly enjoyed by the many young clerks and students present. Dr. Blumenschein presented a resumé of the influence of the Pittsburgh Branch upon the forthcoming editions of the U. S. Pharmacopœia as indicated by acceptance of its recommendations submitted to the Revision Committee from time to time.

Owing to the absence of Dr. J. C. Wallace, his paper, "Present Status of National Legislation," not having reached the Secretary had to be omitted. Dr. J. A. Koch volunteered to occupy the time allotted to Dr. Wallace by an expose of the methods employed by the Revision Committee of the United States Pharmacopœia in preparing the Ninth Decennial Revision of that work, which he presented in generous detail and which proved a revelation to the uninitiated concerning the immense amount of labor there is involved, and made it quite plain why it requires so much time after the convention has adjourned before the Pharmacopœia is ready for distribution.

Dr. Koch also submitted the latest list of proposed deletions from the Pharmacopœia, which brought out quite an interesting discussion. In the main the list of articles to be deleted was commended. Dr. Kutscher objected to the omission of Cataplasma Kaolini for reason that it is being freely prescribed by a good class of medical practitioners, and should they continue to indicate it, which they no doubt will, there being no official standard for same will result in extending the growth of innumerable proprietary preparations of varying formulæ, hence on motion of Dr. George W. Kutscher, supported by Dr. F. J. Blumenschein, it was unanimously

Resolved, That it is the sense of the Pittsburgh Branch of the American Pharmaceutical Association that both kaolinum and its official preparation, cataplasma kaolini, should be retained in the ninth decennial revision of the U. S. Pharmacopœia.

Owing to the fact that June will be a busy month among our members because of preparation for commencement exercises at the college, and the meeting of the Pennsylvania Pharmaceutical Association at Buena Vista Spring, it was decided to omit the June meeting. Therefore the Branch stands adjourned until the second Friday in October.

B. E. PRITCHARD, Secretary.

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NEW YORK BRANCH.

In addition to a score or so of members there were present at the meeting of the New York Branch of the American Pharmaceutical Association on the evening of May 13th, several visiting pharmacists and physicians and a delegation of about a dozen members of the New York Women's Pharmaceutical Association. The meeting was devoted chiefly to a symposium on the subject of "Ergot" which was quite interesting.

Following the report of Treasurer Joseph Weinstein the committee on the progress of pharmacy reported through its Chairman, Otto Raubenheimer. The report told of the Fairchild advanced lectures being given under the auspices of the British schools of pharmacy and of the announcement of a new British Pharmacopœia for next year. Among the published articles referred to were "The Filtration of Bitter Almond Water and Cherry Laurel Water, "The Inaccuracy of Official Tests for Sodium Salicylate," "Identifying Shapes for Tablets," "Sources of Error in the Use of Nylander's and Trommer's Reagents,' 'and "The Determination of Phenolphthalein in Mixtures." Other matters referred to included the new Japanese law regulating the sale of unofficial medicaments, the homeopathic features of the Dresden Hygienic Exposition, a census of German licensed pharmacists and physicians, reported analyses of nostrums in the *Pharmazeutische Zentralhalle*, the approaching meeting of the American Medical Association, and a Treatise on Commercial Pharmacy, a new book by D. C. O'Connor.

For the committee on professional relations, J. L. Lascoff reviewed briefly the joint meeting held May 7th, under the auspices of the Branch and the Medical Society of the County of New York. In connection with this report there ensued some discussion of the suggestion made at the meeting to the effect that a joint committee be named by the

two organizations for the purpose of considering ways and means of certifying the fitness of pharmacies. The President of the Branch was authorized to select ten persons to serve on this committee as representatives of the Branch.

Delegates were appointed as follows to represent the Branch at this year's meeting of State pharmaceutical associations:

New York: Hugo Kantrowitz, J. L. Lascoff, and Hugh Craig.

New Jersey: J. C. Gallagher, Charles Holtzhauer, and Hugh Craig.

Dr. H. H. Rusby was the first speaker in the symposium. His remarks had to do with the character of the ergot received for importation at this port and with ways and means of remedying the conditions which he said tended to prevent the medical practitioner from getting satisfactory results with this drug. Less than 10 per cent. of the ergot brought to the port in the season just closing, he said, was first-class, the defects being largely due to natural conditions which could not be overcome, because the drug is not adapted to cultivation. As some of the sophistic practices which might be eliminated he mentioned the addition of rye grains, clean or only partially ergotized; the soaking of the ergot in water to increase the weight, with subsequent musting and decomposition of the active principles; infestation by insects; the incomplete drying of the drug soon after collection; and faulty packing for shipment and storing.

Whether or not the unplumped ergot was as active as that which had the form designated by the Pharmacopœia the speaker could not say; but, he explained, the government officials were obliged to exclude the thin sort because it varied from the official description. Sifting through a No. 8 sieve, he said, would separate all the passable ergot. He declared that ergot properly and promptly dried and properly kept would not deteriorate in five years. In concluding he expressed the belief that the treasury department should have a clearing house wherein imported drugs could be examined and when necessary made fit for consumption before being put in the market. In connection with his remarks, Dr. Rusby exhibited a number of samples of good and bad ergot.

C. E. Vanderkleed, of Philadelphia, the next speaker, considered "The Chemistry of Ergot." The examination of the drug chemically, he said, was not an example of a very exact science, a hundred experiments having separated a so-called active principle in as many forms, none of which was unquestionably correct. He reviewed the chemical study of the drug since the discovery of the oil in 1817, mentioning in turn the claims advanced for the extract, the resin, the volatile amine, ergotin, ecbolin, ergotinine, and cornutine, as being representative of the therapeutic activity of the drug. He pointed out that each investigator gave a new name to the substance upon which he pinned his faith, although many of the so-called new principles were but more or less pure forms of the same substance. It was his opinion that the correct view of the matter was the one advanced by Barger and his associates, Kraft, and others, that no single substance was truly representative of the virtues of the drug.

Referring to Keller's assay process the speaker showed that its only use was to estimate the total content of mixed alkaloids and non-volatile amines. This assay meant nothing to the physician because it failed to assure uniformity in therapeutic activity; it therefore had to be supplemented by a physiological test. Of these latter, he said, the blood pressure test gave the most nearly concordant results and was the one nearest approaching a definite quantitative test.

Ergot to be satisfactory, he said, must have been carefully selected; must contain at least 0.15 per cent. of total principles separated in Keller's assay process; and, if used in the proportion of 0.8 cc. (mil) of fluidextract per kilo of body weight, must produce an increase of 30 mm. in blood pressure. Because the drug and preparations thereof deteriorate rapidly they must be kept so as to exclude moisture and as far as possible air. He recounted a series of experiments in which it was shown that while a sample of fluidextract kept in a sealed airless tube for a year did not deteriorate in alkaloidal content or power to elevate the blood pressure, some of the same preparation kept in a frequently opened bottle decreased two-thirds in its effect upon the blood pressure and lost more than half its alkaloidal content.

In considering the subject of "Ergot" from the pharmacal standpoint, Cornelius De Jonge said that the selection of the drug was rather difficult for the one who wanted only a first-class quality. This difficulty was increased by the fact that the drug was stored without

any consideration of its liability to deterioration, and that old lots of the drug were frequently mixed with the fresh. Age and soaking change the appearance of ergot and also its odor. He had found from 3 to 8.6 per cent. of moisture in ergot, this year's average being about 8.3 per cent. because the crop shortage had led to considerable wetting to increase the weight. The amount of dust which is caused chiefly by the action of mites varied from 0.13 to 0.56 per cent. in prime lots. Nails and other metallic articles are usually found mixed with the drug.

Mr. De Jonge reviews the ergot preparations of the Pharmacopœias from 1860 to the present time, pointing out the number of variations in the processes. He stated that any exposure of the drug to the action of heat was to be condemned. The buying of the fluidextract in large quantities for dispensing was wrong in his belief because of the deterioration that would follow unless the liquid was immediately transferred to small well-stoppered bottles. Mr. De Jonge exhibited several samples of ergot and some fluidextracts made from thirty-five to forty-four years ago.

In the general discussion of the subject Messrs. von Oefele, Coblentz, Raubenheimer, Lascoff, Weinstein, Dissosway and Bigelow spoke.

A special meeting will be held June 10th, at which time the Branch will hear an address on "Ointment Bases," by Dr. Unna, of Germany. HUGH CRAIG, Secretary.

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CHICAGO BRANCH.

The May meeting of the Chicago Branch of the American Pharmaceutical Association was held Tuesday evening, May 21st, at the University of Illinois School of Pharmacy, and was noteworthy by reason of the presence of Mr. Harry B. Mason, of Detroit, who favored the members of the Branch with an address on the subject, "Why Some Druggists Don't Make More Money." After discussing the subject in a general way, Mr. Mason pointed out the following specific list of blunders which are often responsible for the failure of some druggists to make as much money from their business as they should make: First, they don't keep business accounts. Second, they don't take inventories. Third, they don't know how to figure profits. Fourth, they lose money without knowing it. Fifth, they don't keep the percentage of expense and the percentage of gross profits far enough apart. Sixth, they don't take advantage of their cash discounts.

In closing, Mr. Mason stated that he had not tried to exhaust the catalogue of shortcomings but only to point a few of the reasons why some druggists don't make more money. Neither did he mean to suggest that druggists are any worse than any other retail merchants, but was convinced that as a class druggists do not make that close economic study of their business which the times demand. Modern business is just as much of a science as astronomy, biology or engineering. The old slipshod methods won't go; we are either up-to-date or out-of-date.

Mr. Mason's paper was very well received and a rising vote of thanks was tendered him. A lively discussion followed the reading of the paper. Secretary T. H. Potts of the N. A. R. D., Ex-President J. J. Boehm of the I. Ph. A., Professors Snow, Clark and Patterson, Secretary Day, Mr. Gathercoal, Mr. Sass, Mr. H. W. Snow, Mr. Storer and others voiced their opinions. It was gratifying to the officers of the Branch that the closing meeting of the season should be so well attended and so much interest shown. The next meeting of the Branch will be held in October unless a special meeting should be called during the summer. W. B. DAY, Secretary.

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PHILADELPHIA BRANCH.

In point of numbers in attendance as well as generally aroused interest the May meeting of the Philadelphia Branch ranks well with any previous meeting ever held, a miserably wet night preventing what would have been under more favorable weather conditions an overflow meeting.

Incidentally a long forward stride was made in the direction of placing the conscientious pharmacist before the doctor and the layman in the light of one who is not only alive to his responsibilities to both the latter, but seeking how he may better fulfill his professional obligations to both and thus more intelligently assist in promoting the general welfare.

The cordial co-operation on the part of the physicians present and their enthusiastic interest in the program spoke volumes for what may be accomplished in the way of develop-

ing a better appreciation of the inter-related interests of medicine and pharmacy.

The program was well calculated to stimulate the interest of the retail druggist in the question of handling vaccines, and the frequency with which the speakers referred to the druggist's responsibility as a distributor emphasized the need for some thought along this line.

In evidence of the fact that druggists uniformly do not appreciate the importance of carefully storing these products the statement was made that the Board of Health in one community had found it necessary to establish distributing depots provided with proper facilities for preserving the potency of vaccines because the retail druggists of that particular section had failed to do so.

That such discreditable conditions need not become general was made clear in Mr. Cliffe's excellent paper (which is published in full) wherein he describes a simple method whereby the retail druggist may meet his obligations in this matter with a minimum of expense and a maximum of credit to himself.

Not the least interesting feature of the meeting was the announcement that future programs will be printed in the Roster of the Philadelphia County Medical Society. This move is in response to the frequently expressed desire of physicians to attend such pharmaceutical meetings as are of interest to the medical practitioner if the programs were brought to their attention. The courtesies extended by the representatives of the Medical Society during the program negotiations were acknowledged by a vote of thanks to Dr. J. Torrance Rugh, Chairman Publication Committee, and to Dr. A. Bern Hirsh, Editor of the Roster.

The program below was the result of the combined efforts of Presidents Stewart and Kimberly, the meeting being a joint one of the Branch and Scientific Section:

"The Production of Smallpox Vaccine," (illustrated with lantern slides), by W. F. Elgin, M. D.

"The Production of Bacterial Vaccines," (illustrated with lantern slides), by A. Parker Hitchens, M. D.

"Precautions to be Observed in Storing Vaccines for Distribution," by Wm. L. Cliffe, Ph. G.

"The Arguments of the Antivaccinists and the Measure of Truth and Error Contained Therein," by Jay F. Schamberg, M. D.

The discussion was participated in by Drs. McFarland, Wadsworth and Royer, of the Coroner's Office and the Pennsylvania Board of Health and by members of the Branch.

Changes of Address

All changes of address of members should be sent to the General Secretary promptly.

The Association will not be responsible for non-delivery of the Annual Volume or Year Book, or of the JOURNAL unless notice of change of address is received before shipment or mailing.

Both the old and the new address should be given, thus:

HENRY MILTON,
From 2342 Albion Place, St. Louis, Mo.
To 278 Dartmouth St., Boston, Mass.

Titles or degrees to be used in publications or in the official records should be given, and names should be *plainly* written, or typewritten.

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ALBERT GUY,
From 4836 Delmar, St. Louis, Mo.
To 5270 Delmar, Field Sta., St. Louis, Mo.

LOUIS MAY,
From Tondeau, N. Y.
To Loveman Bros., 473 Broadway, New York, N. Y.

SAMUEL HARRIS, Sgt. H. C., U. S. A.,
From Ludlow Barracks, Mind., P. I.
To Camp Jossman, Guimaras, P. I.

FRANK C. STUTZLEN,
From 231 3d St., Elizabeth, N. J.
To 10 Park Ave., Elizabeth, N. J.

SOPHUA JOERGENSEN,
From Com. St., La Conner, Skagit Co., Wash.
To Front St., La Conner, Skagit Co., Wash.

SAMUEL KRESS,
From 8 Enoch St., Pittsburgh, Pa.
To 209 Idaho St., South Sharon, Pa.

B. O. WILSON,
From 46 Canal St., Boston, Mass.
To 19 Morse St., Newton, Mass.

GARRETT S. LOHMANN,
From 3142 Locust St., St. Louis, Mo.
To 4580 Easton Ave., St. Louis, Mo.

F. M. SCHMIDT,
From 64 W. Randolpn, Chicago, Ill.
To Room 1612 Mallers Bldg., Chicago, Ill.

C. A. HECKLEMAN,
From 2831 Eads Ave., St. Louis, Mo.
To 3511 Juniata St., St. Louis, Mo.

CHAS. E. MATHEWS,
From 234 Randolph St., Chicago, Ill.
To 169 W. Franklin St., Canal Sta., Chicago, Ill.

HORACE R. MACDONALD,
From 181 S. Fuller St., Grand Rapids, Mich.
To 849 Bates St., Grand Rapids, Mich.

D. A. HAYNES,
From 90 William St., New York, N. Y.
To 82 Fulton St., New York, N. Y.

E. J. KENNEDY,
From 90 William St., New York, N. Y.
To 82 Fulton St., New York, N. Y.

F. V. WOOTEN,
From 87 Lake St., Chicago, Ill.
To care United Drug Co., Greenleaf and Leon Sts., Boston, Mass.

FRANCIS J. EISNMAN,
From Camp Gregg, Pangasinan, P. I.
To Ft. Wm. McKinley, P. I.

CARL ANDREEN,
From 1504 4th St., Sioux City, Iowa.
To Olathe, Colo.

I. W. KURTZ,
From Boonville, Mo.
To care J. T. Milliken & Co., St. Louis, Mo.

H. MARTIN,
From 421 S. Broad St., Philadelphia, Pa.
To care Burroughs-Wellcome Co., London, England.

H. C. BARNES,
From 2 S. Jefferson St., Roanoke, Va.
To P. O. Box 672, Roanoke, Va.

O. E. BRUDER,
From 1179 Dearborn Ave., Chicago, Ill.
To 1021 Wolfram St., Chicago, Ill.

PAUL SEYFERT,
From Milwaukee, Wis.
To Theinsville, Wis.

WM. A. HURLBERT,
From Provincetown, Mass.
To Wollaston, Mass.

B. HARDENBROOK,
From 16 Woodland Ave., Arlington, Md.
To 24 Woodland Ave., Arlington, Md.

C. P. SMITH,
From Newark, N. J.
To 1338 P. O. Box, Los Angeles, Cal.

HERMAN HARMS,
From 48 S. Main St., Salt Lake City, Utah.
To 312 Boyd Park Bldg., Salt Lake City, Utah.

DR. R. G. ECCLES,
From 191 Dean St., Brooklyn, N. Y.
To 681 10th St., Brooklyn, N. Y.

HAROLD B. MEADE,
From 434 E. Cosgrove St., Philadelphia, Pa.
To 133 E. St. N. W., Washington, D. C.

CHAS. HERRON,
From Saint Marys, Pa.
To Du Bois, Pa.

EDWARD ROGERS,
From U. S. M. Hosp., Port Townsend, Wash.
To U. S. M. Hosp., San Francisco, Cal.

ROY M. SOULE,
From 422 Hastings St., Pittsburgh, Pa.
To 6560 Rowak Ave., East Liberty Sta., Pittsburgh, Pa.

LUCIUS P. BROWN,
From 818 Church St., Nashville, Tenn.
To 312 6th Ave. N., Nashville, Tenn.

DR. H. F. GERALD,
From 50 Merrimack St., Haverhill, Mass.
To Saltz Apartment, 94 Emerson St., Haverhill, Mass.

A. J. LEAVITT,
From 261 Romona St., Pasedena, Cal.
To 590 N. Raymond Ave., Pasedena, Cal.

F. R. WILLIAMS,
From Ft. Leavenworth, Kansas.
To Camp Jossman, Guimaras, P. I.

F. T. GORDON,
From 424 Linden Ave., Riverton, N. J.
To 2113 W. Norris St., Philadelphia, Pa.

OTTO FREDERICK FRESE, Sgt. U. C., U. S. A.,
From Ft. D. A. Russell, Cheyenne, Wyo.
To Camp Keithley, Mindanao, P. I.

C. H. BIERMAN,
From U. S. Marine Hospital, Baltimore, Md.
To U. S. Marine Hospital, Portland, Maine.

F. O. TAYLOR,
From 659 2d Ave., Detroit, Mich.
To 53 Alexandrine Ave., Detroit, Mich.

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DECEASED MEMBERS, APRIL, 1912.

Frank D. Jeffrey, 503 Park Ave., Hot Springs, Ark.

William H. Stanford, 356 Mulberry St., Newark, N. J.

Christopher E. Strunz, 100 Michigan St., Pueblo, Colo.

Chas. L. Stillman, Lead, S. Dak.

John R. Major, 800 7th St., Washington, D. C.

Benjamin Stanley Woodworth, Ft. Wayne, Ind.

B. T. Raiker, U. S. A. Gen. Hosp., San Francisco, Cal.

Dr. Enno Sander, 2801-2811 Lawton St., St. Louis, Mo.

Ernest Molwitz, 2707 8th Ave., New York, N. Y.

Edward T. Green, 30-32 Platt St., New York, N. Y.

Samuel L. Rumsey, Honolulu, Hawaii.

Herschell Boynton, Biddeford, Maine.